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Final Response to BDAT Related Comments Document Halogenated Organic Wastes. Volume 1-N

(U.S.) Environmental Protection Agency, Washington, DC

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This response to comments document only addresses those comments which were submitted on the proposed land disposal restrictions for those waste codes and general BDAT technologies and issues which relate to Third Third Wastes Treatment Standards.

The commenters presented in this document are grouped according to major concerns of the commenters.

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FINAL
RESPONSE TO BDAT RELATED COMMENTS DOCUMENT

Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compounds, and Organo-Nitrogen Compound Wastes
and
Halogenated Pesticide and Chlorobenzene, Halogeneated Phenolic, and Phenolic Wastes

VOLUME I-N

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May 1990

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INTRODUCTION

This response to comments document only addresses those comments which were submitted on the proposed land disposal restrictions for those waste codes and general BDAT technologies and issues which relate to Third Third Wastes Treatment Standards.

The commenters presented in this document are grouped according to major concerns of the commenters. This document is comprised of the following sections:

ISSUE CODE 1: General BDAT Aspects
ISSUE CODE 2: D001 - Characteristic Ignitable Wastes
ISSUE CODE 3: D002 - Characteristic Corrosive Wastes
ISSUE CODE 4: D003 - Characteristic Reactive Wastes and P and U Wastes Containing Reactive Listing Constituents
ISSUE CODE 5: D004/D010 - Characteristic Wastes for Arsenic and Selenium and K, P, and U Wastes Containing Arsenic and Selenium
ISSUE CODE 6: D005 - Characteristic Wastes for Barium and P013
ISSUE CODE 7: D006 - Characteristic Wastes for Cadmium
ISSUE CODE 8: D007 - Characteristic Wastes for Chromium
ISSUE CODE 9: D008 - Characteristic Wastes for Lead P and U Wastes Containing Lead
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ISSUE CODE 11: K044, K045, K047: Wastes from the Manufacturing and Processing of Explosives
ISSUE CODE 12: D011 - Characteristic Wastes for Silver
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ISSUE CODE 25: K015 - Still Bottoms from Benzal Chloride

ISSUE CODE 26: K021 - Spent Antimony Catalyst.

(No Comments Were Received for this Waste Code)

ISSUE CODE 27: K046 - WW Treatment Sludges from Manufacturing, Formulating, and Loading of Lead-Based Initiating Compounds

ISSUE CODE 28: K060 - Ammonia Still Lime Sludge.

(No Comments Were Received for this Waste Code)

ISSUE CODE 29: K061 - Electric Arc Furnace Dust

ISSUE CODE 30: K069 - Emission Control Dust/Sludge from Secondary Lead Smelting

ISSUE CODE 31: K071, K106 - Mercury Cell Process Wastes

ISSUE CODE 32: K073 - Chlorinated Hydrocarbon Wastes.

(No Comments Were Received for this Waste Code)

ISSUE CODE 33: K086 - Residues from Ink Formulation

ISSUE CODE 34: K100 - Waste Leaching Solution from Acid Leaching of Emission Control Dust/Sludge from Secondary Lead Smelting

(No Comments Were Received for this Waste Code)

ISSUE CODE 35: Wastes Containing Cyanide

ISSUE CODE 36: K017 - Wastes from the production of Epichlorohydrin

(No Comments Were Received for this Waste Code)

ISSUE CODE 37: K028,K029, K095, K096 - Production of 1,1,1-Trichloroethane

ISSUE CODE 38: Wastewaters containing BDAT Constituents

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(No Comments Were Received for this Waste Code)

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(No Comments Were Received for this Waste Code)

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Commenters are identified by both commenter number and commenter name. Comments within each section of this document have been assigned a sequential comment number.

Issues were obtained from the original comment submittal and were categorized based on the grouping specified above. The Agency's response to each comment follows immediately after the text of the document. For responses related to capacity issues, the reader should review the "Response to Comments Background Document for the Third Third Land Disposal Restrictions Proposed Rule, November 22, 1989. Volume II Capacity Related Comments." For information regarding broad policy questions, the reader is directed to the "Response to Comments Background Document for the Third Third Land Disposal Restrictions Proposed Rule, November 22, 1989. Volume III Policy Related Comments."

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    i. Use of Indicator Parameters to Evaluate Effectiveness of Treatment
    ii. Oppose Use of Indicator/Surrogate Parameters for Phenolic Wastes
    iii. Linkage of Carbon Adsorption to Oxidation is Too Restrictive
    iv. Biological Treatment Should be Specified as a BDAT Option
E.-. Thermal Treatment/Fuel Substitution
    i. Supports Fuel Substitution as an Alternative BDAT Treatment Method
    ii. Recycling in Cement Kilns as Alternative to Incineration
    iii. Corrective Action Operations
F.-. PQL/Analytical Issues
    i. BDAT Standards Below PQLs
    ii. PQL, MDL Definition
    iii. SW-846 Analytical Methods
    iv. Determination of MDLs
    v. Matrix-Dependent Correction Factors
    vi. EPA Modification of Matrix Factors, Detection Limits, and Procedures

ISSUE CODE 46: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

(Continuation)

- vii. Data Reliability from EPA Contracts Labs
- viii. BDAT Generic QAPP
- ix. EPA's Use of Non-SW-846 Analytical Methods
- x. Variance Procedure When Compliance Cannot be Measured with Available Analytical Methods

G.-. Miscellaneous Halogenateds

- i. Analytical Methods for U062 (Diallate)
- ii. Analytical Methods for P028 (Benzyl Chloride)
- iii. Nonwastewater Standard for U043 (Vinyl Chloride)
- iv. Rotary Kiln Incineration as BDAT versus Other Types of Incinerators
- v. Linkage of Carbon Adsorption to Oxidation is Too Restrictive
- vi. Biological Treatment Should be Specified as a BDAT Option
- vii. Opposes Regulation of U075 (Dichlorodifluoromethane) and U121 (Trichlorofluoromethane)
- viii. Supports Fuel Substitution as an Alternative BDAT Treatment Method

H.-. Organosulfur Compounds

- i. Wastewater and Nonwastewater Standards Based on Incinerator Ash and Scrubber Water are Arbitrary
- ii. Operational Requirements on Hazardous Waste Incinerators
- iii. Data Submittal for Chlorine Dioxide Treatment of Organosulfur Compounds

Comment Number: 46-Ai-1

Docket Number: LD12-00128

Commenter: Vulcan Materials Company

Issue: ISSUE CODE 46: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: Halogenated Aliphatics

Comment:

Our review of the concentration-based BDAT standards for nonwastewater residuals for the halogenated aliphatics, such as chloroform, methylene chloride and hexachloroethane, indicate that the levels of organic residuals in the nonwastewaters is reasonable. However, the proposed BDAT standards for wastewaters resulting from the treatment of the halogenated aliphatics are not at all reasonable. The majority of the concentration-based standards cited on p.48396, column 3, are 0.007 mg/L for each constituent, which are in the realm of acceptable drinking water, not wastewater which might be land disposed. For example, the BDAT treatment standard for wastewaters containing 1,2-dichloroethane is proposed at 0.007 mg/L, as compared to the EPA drinking water standard of 0.005 mg/L. An even more striking example is the BDAT standard of 0.007 mg/L for 1,1,1-trichloroethane. The NPDWR for this chemical is 0.200 mg/L, almost 30 times higher than the proposed BDAT standard. Thus, we must protest the unreasonable low BDAT standards being proposed for halogenated aliphatic wastewaters. This same objection applies to the BDAT standards for most of the wastewaters addressed in Section III.A.2.b.(3) of the proposed rule.[p.48395]

Comment Number: 46-Ai-1

Docket Number: LD12 - 00128

Commenter: Vulcan Materials Company

Issue: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: Halogenated Aliphatics

Response:

The commenter believes that while the proposed concentration-based BDAT treatment standards for nonwastewater forms of halogenated aliphatic wastes are reasonable, the proposed concentration-based BDAT treatment standards for wastewater forms of halogenated aliphatic wastes are too low. The commenter points out that the proposed standards require wastewater be treated to acceptable drinking water levels prior to disposal. For example, the BDAT treatment standard for U077 (1,2-dichloroethane) is 0.007 mg/L, as compared to the EPA drinking water standard of 0.005 mg/L.

Development of BDAT treatment standards is based on the best demonstrated and available technology, an approach sustained by the DC Circuit Court in HWTC v. EPA, 886 F.2d 355 (D.C. Cir. Sept. 15, 1989). Concentration-based standards are calculated from data on the concentrations of constituents of concern in the treated waste obtained from treatability tests run on the BDAT technology. As a result, treatment standards that are at or near the drinking water levels are acceptable since the treatment performance data indicated that those levels are consistently achievable.

The proposed BDAT wastewater treatment standards for halogenated aliphatic wastes were based on scrubber water concentration data obtained from 14 incineration treatment tests. For promulgation, EPA is changing this approach, since EPA prefers, whenever possible, to establish treatment standards for wastewater forms of wastes based on wastewater treatment performance data rather than incinerator scrubber water data. Promulgated BDAT wastewater treatment standards for halogenated aliphatic wastes are based on wastewater treatment data that were compiled by the Agency for establishing treatment standards for multi-source leachates. In general, the promulgated halogenated aliphatic wastewater standards are one to two orders of magnitude higher than the proposed standards. For example, the wastewater standard for U077 (1,2-dichloroethane) will be 0.21 mg/L.

Comment Number: 46-Bi-1

Docket Number: LD12-00087

Commenter: CYANAMID

Issue: ISSUE CODE 46: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: Organonitrogen Compounds

Comment:

III. EPA should use cyanide as surrogate compound for P069 (Methyllactonitrile) for establishing concentration levels for BDAT.

EPA has proposed incineration as BDAT for P069 nonwastewaters and wet air oxidation or chemical oxidation followed by carbon adsorption; biodegradation followed by carbon adsorption; or incineration as methods of treatment for P069 wastewaters. The Agency has not established a concentration limit because calibration reagents are not commercially available (54 FR 48416). A surrogate compound for methyllactonitrile is cyanide. American Cyanamid has used cyanide methods historically as a surrogate and found good correlation and recovery of cyanide using both total and amenable cyanide methods. We are collecting data to demonstrate this correlation with the appropriate quality assurance/quality control protocols to submit by February 15, 1990. Even though the Agency does not have treatability data for P069, we believe it would be preferable to establish cyanide concentration limits by transferring data from P063 (hydrocyanic acid). The levels established for P063 are 100 mg/kg cyanide (total) and 9.1 mg/kg cyanide (amenable) for nonwastewaters and 1.9 cyanide (total) mg/l and 0.10 mg/l cyanide (amenable) for wastewaters. The BDAT standard for the nonwastewater forms of P063 is based upon alkaline chlorination for the cyanide constituent. BDAT for the wastewater forms of P063 is based on the performance of alkaline chlorination for the cyanide constituent. American Cyanamid recommends that EPA set concentration limits for P069 based upon cyanide levels established in similar wastes.

Comment Number: 46-Bi-1

Docket Number: LD12 - 00087

Commenter: Cyanamid

Issue: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: Organonitrogen Compounds

Response:

The commenter states that instead of setting the proposed methods of treatment as the BDAT treatment standards for P069 (methyllactonitrile) nonwastewaters and wastewaters, EPA should use a surrogate compound to establish concentration-based treatment standards. The commenter suggests using cyanide as a surrogate for P069, and claims that they have found good correlation and recovery of cyanide using both total and amenable cyanide methods. In addition, it is recommended that concentration-based BDAT treatment standards be calculated for P069 nonwastewaters and wastewaters by transferring data from P063 (hydrocyanic acid), using alkaline chlorination as BDAT.

There is currently no EPA-approved SW-846 analytical method for P069. P069 breaks down quickly in water, and as a result there are no commercially available calibration reagents. Since no SW-846 methods exist for methyllactonitrile, concentration-based BDAT treatment standards cannot be established for P069. Whereas cyanide is an appropriate surrogate for hydrocyanic acid, the Agency has no data supporting the use of cyanide as an appropriate surrogate for methyllactonitrile (The commenter did not submit the correlation data referred to in their comment). As such, a transfer of treatment data for P063 to calculate BDAT treatment standards for P069 is inappropriate. As a result, EPA is promulgating the proposed methods of treatment as BDAT treatment standards for P069; incineration for nonwastewaters, and incineration, chemical oxidation followed by carbon adsorption, or wet air oxidation followed by carbon adsorption for wastewaters.

Comment Number: 46-Bii-1

Docket Number: LD12-00087

Commenter: CYANAMID

Issue: ISSUE CODE 46: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: Organonitrogen Compounds

Comment:

II. EPA should establish concentration based limits for U007 (Acrylamide) wastes based upon data submitted for treatment of K011, K013, and K014 wastewaters.

EPA is proposing a treatment standard based on incineration for U007 because, although U007 can be quantified, the Agency has no analytical data to set treatment standards.

However, EPA has established treatment levels for acrylamide in K011, K013, and K014 nonwastewaters and proposed treatment levels for acrylamide in K011, K013, and K014 wastewaters. The nonwastewater treatment levels are based upon incineration performance which is the technology being proposed for treatment of U007. Even though the Agency does not have analytical data from incineration of U007 it would be preferable to set treatment levels by transferring data from treatment of K011, K013, and K014. The BDAT treatment standard established for acrylamide in nonwastewater K011, K013, and K014 is 23 mg/kg (Maximum for any grab sample, total concentration) (54 FR 26613). The proposed BDAT treatment standard for acrylamide in wastewater K011, K013, and K014 is 19 mg/l (54 FR 48448). The wastewater treatment standard is based upon wet air oxidation with influent acrylamide concentrations ranging from 1 to 1200 mg/l. American Cyanamid recommends that EPA base BDAT treatment standards for U007 on wet air oxidation treatment levels established for K011, K013, and K014 nonwastewaters and wastewaters. As noted in Table III.B.2(c) of the proposal (54 FR 48487), inadequate capacity currently exists to treat injected wastes requiring this type of treatment, thereby justifying a two-year variance for U007.

Comment Number: 46-Bii-1

Docket Number: LD12 - 00087

Commenter: Cyanamid

Issue: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: Organonitrogen Wastes

Response:

The commenter opposes setting methods of treatment as the BDAT treatment standards for U007 (acrylamide) nonwastewaters and wastewaters. Instead, the commenter suggests establishing concentration-based treatment standards for U007 wastes based on treatment data transferred from K011, K013, and K014 wastewaters.

The commenter is correct in saying that treatment data exists for acrylamide from the K011, K013, and K014 treatment test; however, the Agency is not using this data for two reasons. First, the acrylamide analyses conducted in this test were done using a non-SW-846 analytical method, namely an HPLC method which EPA considers unsuitable in the analysis of U and P components, specifically designed for the waste treated in this test. The Agency believes that although concentration-based BDAT treatment standards developed using these data are accurate, they are only applicable to acrylamide in K011, K013, or K014 waste matrices. Furthermore, after reviewing treatment performance data from the land disposal restriction program's incineration treatment test data base, the Agency determined that the data from the K011, K013, and K014 treatment test (Test 3) were not suitable for use in developing treatment standards for organic U and P and multi-source leachate (F039) wastes. Data from Test 3 were not considered because the detection limits for the U and P constituents were clearly above the average detection limits for the same constituents from the other incineration tests. In addition, the wastes treated in Test 3 did not contain significant concentrations of the U and P constituents of concern.

As a result, EPA does not have the necessary data to promulgate concentration-based BDAT treatment standards for U007, and is therefore promulgating the following methods of treatment as the treatment standards: incineration for U007 nonwastewaters, and incineration, chemical oxidation followed by carbon adsorption, or wet air oxidation followed by carbon adsorption for U007 wastewaters.

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Comment Number: 46-Biii-1

Docket Number: LD12-00159

Commenter: WASTE MANAGEMENT, INC. and CHEMICAL WASTE MANAGEMENT, INC.

Issue: **ISSUE CODE 46: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes**

Subissue: Organonitrogen Compounds

Comment:

B. Organo-Sulfur/Organo-Nitrogen Ash Treatment Standards (Fed. Reg. at 48,414-17)

The Agency proposes concentration-based treatment standards at the analytical detection limit for a number of organic compounds in this section. This approach incorrectly assumes that incineration is capable of 100% destruction of a compound resulting in no analytical detection of such compound in the ash. WMI believes the Agency's reasoning is technically incorrect for the following reasons.

1. Establishing treatment standards based on a concentration level per unit of ash is arbitrary and does not accurately reflect the waste feeds to the incinerator. Further, such arbitrary standards may over or underestimate the actual performance of the incineration unit.

2. Commercial incineration units typically burn waste from more than one waste feed system simultaneously. As such, wastes having high and low ash contents are typically fed. Burning a waste with a high ash content along with an organo-sulfur or organo-nitrogen compound would result in a lower concentration of organic constituents in the ash. Conversely, a low ash waste feed would increase the concentration in the ash. The volume of ash determines the constituent concentration in the ash. Accordingly, a waste containing high ash content may be

cont.

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Comment Number: 46-Biii - 1 (continued)

Docket Number: LD12-00159

Commenter: WASTE MANAGEMENT, INC. and CHEMICAL WASTE MANAGEMENT, INC. (continued)

Issue: ISSUE CODE 46: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue:

Comment. Organonitrogen Compounds

construed as impermissible dilution of other low ash wastes that have numerical ash limitations.

3. The analytical detection limits vary depending upon a number of factors. For example, those compounds which are in wide use or for which there are environmental concerns may have well defined and lower analytical detection limits. For this reason, application of analytical detection limits is arbitrary. If it is assumed that a numerical limitation is required, then the limitation should be established based on incinerator performance criteria and then adjusted for analytical considerations.

The above comments also apply to the chemistry and quality of scrubber waters generated by incinerators. A broad variety of wet scrubbing devices are utilized and the volumes of water used by these devices and the design and operation for scrubber systems are variable. Therefore, it is impractical to confirm performance on a daily basis and any relevance to the proposed standards is probably coincidental.

Comment Number: 46-Biii-1

Docket Number: LD12 - 00159

Commenter: **Waste Management, Inc. and Chemical Waste Management, Inc.**

Issue: **Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes**

Subissue: **Organonitrogen Wastes**

Response:

The commenter opposes the Agency's approach of setting concentration-based treatment standards at the analytical detection limit for organonitrogen wastes. The commenter contends that this approach is arbitrary and does not accurately reflect variability in the waste feeds to the incinerator. The commenter also states that the volume of ash in the waste feed, as well as the performance of the particular incinerator, determines the constituent concentration in the ash. The commenter suggests that, if concentration-based treatment standards are deemed necessary by EPA, these standards should be established based on incineration performance criteria and then adjusted for analytical considerations. Finally, the commenter maintains that the design and operation of scrubber systems is variable and that any relevance to proposed wastewater standards is probably coincidental.

EPA prefers to establish concentration-based BDAT treatment standards whenever possible, ie. when characterization and treatability data is available for the waste constituent of interest. By setting concentration-based standards, the regulated community has the option of meeting the treatment standard for their waste(s) either by using the technology identified as BDAT, or by using another treatment method that can meet the standards. Promulgated treatment standards reflect the best treatment achievable by demonstrated and available technologies. The best technologies usually are capable of treating wastes to analytical detection limits, as determined during EPA treatment tests. This is particularly true for destruction technologies such as incineration. As a result, many standards for organic constituents are based on analytical detection limits.

Incineration is a BDAT treatment technology specified for a large number of the BDAT program regulated wastes. Incineration data used in the development of BDAT treatment standards for U & P wastes were obtained from 14 incineration tests conducted at not one but five different incinerators, with very few waste constituents being detected in the ash or scrubber water. These treatment tests were conducted using a variety of wastes, in order to account for different potential waste feeds. Each waste contained a variety of U and P constituents. A concentration-based treatment standard for an analyzable organo-nitrogen constituent in U and P nonwastewaters was developed from the highest ash detection limit obtained from the 14 tests, unless the constituent was detected in a particular test or tests, in which case the highest ash detection limit from those tests was used. In calculating treatment standards, the selected detection limits were multiplied by correction factors to account for matrix and analytical variabilities. As a result, well-designed and operated incinerators should have no trouble attaining the numerical treatment standards.

EPA is promulgating incineration as a method of treatment as the BDAT treatment standard for nonanalyzable U and P nonwastewater and wastewater constituents. The wastes must be treated by incineration, but EPA is not requiring any particular ash concentration of BDAT List constituents be reached.

EPA is promulgating concentration-based BDAT treatment standards for analyzable U and P wastewater constituents using multi-source leachate data, not incinerator scrubber water data. See Volume A of the U and P Waste and Multi-Source Leachate (F039) background document for more information.

Comment Number: 46-Biv-1

Docket Number: LD12-00129

Commenter: OLIN CHEMICALS

Issue: ISSUE CODE 46: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: Organonitrogen Compounds

Comment:

Nitro Compounds (III.A.3.f.(4).(e))

USEPA is specifying a concentration based standard for U105 and U106 (2,4 and 2,6 Dinitrotoluene respectively) based directly on incineration. Olin has checked with the various commercial incinerators throughout the United States and has not been able to find one that would accept the waste U105 or U106. The facilities will accept some "derived-from" U105 and U106 depending upon concentration and form. A list (along with dates and contacts) for each of the incinerators contacted is attached as Appendix I.

At this time, Olin has not been able to locate any alternate treatment to land disposal of U105 or U106, and request that the Agency not restrict land disposal.

Comment Number: 46-Biv-1

Docket Number: LD12 - 00129

Commenter: Olin Chemicals

Issue: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: Organonitrogen Wastes

Response:

The commenter restates from the proposed rule that EPA is specifying concentration-based BDAT treatment standards for U105 (2,4-Dinitrotoluene) and U106 (2,6-Dinitrotoluene) based directly on incineration. The commenter has been unable to identify commercial incinerators in the U.S. that will accept either of these wastes. The commenter finally requests that the Agency not restrict land disposal of these wastes.

The Agency points out to the commenter that EPA is required by law to promulgate BDAT land disposal restrictions for U105 and U106. If EPA fails to promulgate these restrictions by May 8, 1990, then the "hard hammer" would fall, and facilities would automatically be prohibited from land disposing these U105 and U106 wastes.

Concentration-based BDAT treatment standards for wastewater forms of U105 and U106 are based on characterization data obtained from PACT^R treatment. Regulated facilities have the option of using this technology, or any other technology (such as incineration) which will treat these wastes to below the BDAT standard, prior to land disposal.

For nonwastewater forms of U105 and U106, the Agency based concentration-based treatment standards on ash data obtained from 14 different test burns. It is the Agency's belief that commercial incinerators will, at some point, accept these wastes; however, the commenter may apply for a capacity variance from the regulation should they still encounter a lack of incineration capacity. This issue is addressed in the capacity comment section elsewhere in the comment document.

Comment Number: 46-BV-1

Docket Number: LD12-00179

Commenter: THE DOW CHEMICAL COMPANY

Issue: ISSUE CODE 46: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: Organonitrogen Compounds

Comment:

XX. EPA SHOULD NOT, UNDER THE LAND DISPOSAL RESTRICTIONS PROGRAM, IMPOSE DETAILED OPERATIONAL REQUIREMENTS ON HAZARDOUS WASTE INCINERATORS.

54 Fed. Reg. 48,403, 48,417, 48,501

In the preamble to the Third Third proposal, EPA has expressed several concerns about air emissions that may result from treatment of wastes using technologies that have been identified as BDAT. See, e.g., 54 Fed. Reg. 48,501. In particular, the Agency has expressed concern "whether incineration of brominated organics or organo-nitrogen compounds may adversely affect air quality." 54 Fed. Reg. 48,502. Dow believes that these concerns, to the extent they are valid, are best addressed in the context of the Clean Air Act regulatory program or other aspects of the RCRA program.

EPA asserts that incineration of brominated organics may lead to "the release of toxic bromine gas." 54 Fed. Reg. 48,403. In order to avoid this perceived problem, the Agency has proposed a number of alternative control strategies, including requiring the addition sulfur whenever brominated compounds are burned and limiting the amount of bromine that can be burned in an incinerator. Id. These approaches, however, pose substantial implementation problems because, as EPA recognized, "different incinerators have different designs" that may warrant different controls. Id. Moreover, addition of sulfur may create new environmental problems such as the release into the air of sulfur dioxide. Dow believes that EPA's concerns can be better addressed through mechanisms other than the land disposal restrictions program.

EPA also expresses concern about the potential nitrogen and sulfur emissions generated from the incineration of organosulfur compounds. According to the Agency, "[t]he formation of nitrogen or sulfur oxides in the process of incinerating any of these compounds may require additional controls in order to meet air quality requirements pursuant to Section 108, 110 and 111 of the Clean Air Act or New Source Review under the CAA's Prevention of Significant Deterioration program." 54 Fed. Reg. 48,417. Given the fact that nitrogen and sulfur oxides are currently regulated under the Clean Air Act, Dow sees no reason why these concerns cannot be addressed under that statute. Indeed, Dow believes that EPA is obliged to use its authority under the Clean Air Act rather than its authority under RCRA Subtitle C. RCRA section 1006(b) explicitly directs EPA to "avoid duplication, to the maximum extent practicable, with the appropriate provisions of the Clean Air Act."

Comment Number: 46-Bv-1

Docket Number: LD12 - 00179

Commenter: The Dow Chemical Company

Issue: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: Organonitrogen Wastes

Response:

The commenter believes that air emission concerns associated with the incineration of organonitrogen and organosulfur compounds are best addressed under the Clean Air Act and other aspects of the RCRA program.

The Agency agrees with the commenter and is leaving responsibility for air quality at hazardous waste treatment facilities to the RCRA permitting process under 40 CFR 264 and 270.

The proposed rule solicited comment on several air emissions-related technical problems and regulatory issues anticipated to complicate the incineration of organonitrogen wastes. The issues all arise from the corrosive behavior of oxidized nitrogen compounds, some of which are regulated under the Clean Air Act. The Agency received limited data characterizing NOx generation at several RCRA-permitting test burns, and received a narrative description of emissions control systems at one of these incinerators. However, the information was not detailed enough to specify process design and operation parameter values, to define BDAT as incineration, or to specify emissions controls for all facilities disposing of organonitrogen wastes.

The RCRA permitting procedure requires Regional or State approval of the entire incinerator system, including process feed and air emissions control units. Additionally, NOx emissions are specifically limited by Clean Air Act stationary source permit requirements. Since both of these permits are issued on an individual facility basis, allowing individualized process controls, and since EPA lacks adequate data to dictate realistic NOx control system design, EPA agrees with this commenter and chooses not to mandate air emissions control for organonitrogen and organosulfur incineration systems. Permit-by-permit determinations under the RCRA omnibus authority may be the most appropriate air emissions control regulation for facilities burning these wastes. RCRA Section 3005(c)(3) states that "each permit issued under this section shall contain such terms and conditions as the Administrator (or the State) determines necessary to protect human health and the environment." EPA intends to provide guidance to permit writers with respect to facilities burning these wastes.

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Comment Number: 46-Bvi-1

Docket Number: LD12-00159

Commenter: WASTE MANAGEMENT, INC. and CHEMICAL WASTE MANAGEMENT, INC.

Issue: ISSUE CODE 46: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: Organonitrogen Compounds

Comment

C. Additional Incinerator Controls When Burning Certain Listed Wastes (54 Fed. Reg. at 48,414-15)

In its proposal, the Agency expresses concern regarding potential nitrogen oxide emissions from the incineration of wastes containing organo-nitrogen and organo-sulfur compounds. 54 Fed. Reg. at 48,414-17. Specifically, the Agency is considering whether additional air emission controls should be imposed -- under either RCRA or the Clean Air Act -- when incinerating such materials. Id. at 48,415. The Agency also requests operating data related to the generation and control of nitrogen and sulfur oxide in hazardous waste incineration systems. Id. at 48,417.

WMI recently conducted testing of NOx emissions on two occasions at its Trade Waste Incineration facility ("TWI") and one occasion at its Chicago Chemical Services Incineration facility ("Chicago"). The data sets for CWM's TWI facility were collected for two distinct purposes: (1) a RCRA Trial Burn conducted in January 1989; and (2) a test burn specifically designed to demonstrate performance while incinerating Dinoseb in 1989. Data for the Chicago facility were collected during a RCRA Trial burn in July 1989. These testing events and their results are summarized below.

1. TWI Unit Number 3

TWI's Unit #3 is similar to most commercial hazardous

cont.

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Comment Number: 46-Bvi-1 (Continued)

Docket Number: LD12-0059.

Commenter: WASTE MANAGEMENT, INC. and CHEMICAL WASTE MANAGEMENT, INC. (continued)

Issue: ISSUE CODE 46: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: Organonitrogen Compounds

Comment:

waste incinerators in that it employs multiple feed systems to handle the variability in waste streams. Unit #3 is somewhat unique in that the incinerator is equipped with a high temperature dry scrubber and a rotary atomizer. Operating temperatures are maintained in the unit by using energetic waste streams supplemented by purchased fuels, typically #2 diesel. A significant contribution of NOx formation may result from the oxidation of fuel-bound nitrogen.

a. January 1989 RCRA Trial Burn

o During the RCRA Trial Burn, the nitrogen component of the waste feeds was not determined.

o The concentrations of NOx emissions during the Trial Burn ranged from 127 ppm to 146 ppm.

o Unit #3 demonstrated performance in accordance with the RCRA incinerator operating requirements at a thermal input of 16 million Btus, with emissions per million BTU of 0.5 lb., 0.57 lb. and 0.58 lb.

b. 1989 Dinoseb Test Burn

o The Dinoseb burn involved the feeding of 30% to 60% Dinoseb in organic solvent, 30% to 50% Dinoseb alkanolamine salts in water and 15% Dinoseb salts/pesticide mix and 90% to 95% technical grade Dinoseb. The nitrogen component of other feeds was not determined.

cont.

Comment Number: 46-Bvi-1 (Continued)

Docket Number: LD12-00159

Commenter: WASTE MANAGEMENT, INC. and CHEMICAL WASTE MANAGEMENT, INC. (continued)

Issue: ISSUE CODE 46: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue Organonitrogen Compounds

Comment:

- During the Dinoseb test burn, the NOx emissions range was 138 ppm to 186 ppm. It must be noted that the air flow through the unit during the Dinoseb program averaged approximately 25% less than the operating conditions during the January 1989 trial burn. The reason for the operational change is that the Dinoseb conditions were representative of typical operating conditions versus Trial Burn conditions, which attempt to maximize operational parameters.

- Assuming TWI Unit #3 was operating at the maximum thermal input (16 million BTU), the Dinoseb test burn resulted in emissions of 0.41 ppm BTU (lb/mmBTU), 0.53 lb/mmBTU and 0.55 lb/mmBTU.

2. CWM's Chicago Facility

A RCRA Trial Burn was conducted at the facility in July 1989 and NOx emissions were monitored for four (4) RCRA test runs. The CWM Chicago incinerator device is equipped with a quench chamber followed by two counter current packed scrubbers. The discharge from the scrubbers divides into four (4) ionizing wet scrubbers equipped with scrubber sections. Gas flows are then recombined into two chevron type demisters. Liquid organics, Solids, Aqueous and Fuel Oil feeds contributed to the BTU input into the unit during the Trial Burn. The nitrogen component of the waste feeds was not determined in this program.

cont.

Comment Number: 46 - Bui - 1 (Continued)

Docket Number: LD12 - 00159

Commenter: WASTE MANAGEMENT, INC. and CHEMICAL WASTE MANAGEMENT, INC. (continued)

Issue: ISSUE CODE 46: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: Organonitrogen Compounds

Comment:

- Average NOx emissions levels were 91, 98, 99 and 102 ppm. Based on the total BTU input into the unit during the test, the emissions rates in pounds per million BTU were 0.16 for the first three (3) runs and 0.17 for the fourth run.

3. Conclusions

- The test burn data has been evaluated and summarized in pounds of NOx per million BTUs of heat release. The emission levels can therefore be compared to the New Source Performance Standards (NSPS) established in 40 C.F.R. Part 60.

- The NSPS for fossil fuel fired steam generators with BTU inputs of greater than 250 million BTUs range from 0.50 to 0.80 lb/mmBTU for solid fuels (40 C.F.R. Part 60.44a).

- Although the foregoing information is generalized, it appears that TWI's Unit #3 operates at or below current steam generator emission rates for NOx. The data from CWM's Chicago facility indicates that unit performs substantially below the rates allowed for steam generators.

- The testing at the TWI unit would seem to indicate that NOx emissions are not significantly affected by burning a waste with a high nitrogen content (Dinoseb - P020 - 2,4-dinitro-6-sec-butylphenol). The nitrogen component of fuels

cont.

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Comment Number: 46-Bui-1 (Continued)

Docket Number: LD12-00159

Commenter: WASTE MANAGEMENT, INC. and CHEMICAL WASTE MANAGEMENT, INC. (continued)

Issue: ISSUE CODE 46: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: Organonitrogen Compounds

Comment:

and other waste feeds may have a greater impact on NOx emissions than organo-nitrogen compounds being fed.

o It is cautioned that the efficiencies of the air pollution control equipment cannot be compared on the basis of the data provided. No conclusions regarding performance of dry scrubber systems versus wet scrubbing systems for NOx removal can be derived from these comments.

o If the NOx concentrations obtained in the foregoing tests are typical of RCRA incineration devices across the country, the NOx contribution in pounds of NOx emitted is minuscule compared to the contribution by power plants operating at or below the NSPS emission rates. However, CWM continues to study NOx emissions from the facilities it operates.

Comment Number: 46-Bvi-1

Docket Number: LD12 - 00159

Commenter: Waste Management, Inc. and Chemical Waste Management, Inc.

Issue: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: Organonitrogen Wastes

Response:

The commenter is supplying operating data related to the generation and control of nitrogen oxide in hazardous waste incineration systems.

The proposed rule solicited comment on several air emissions-related technical problems and regulatory issues anticipated to complicate the incineration of organonitrogen wastes. The issues all arise from the corrosive behavior of oxidized nitrogen compounds, some of which are regulated under the Clean Air Act. The Agency received limited data from this commenter characterizing NOx generation at several RCRA-permitting test burns incinerating several organonitrogen wastes, plus a narrative description of emissions control systems at one of these incinerators. These data showed low NOx emissions. However, the information was not detailed enough in terms of specifying process design and operation parameter values for EPA to use in defining BDAT as incineration plus specified emissions controls for all facilities disposing of organonitrogen wastes.

The RCRA permitting procedure requires Regional or State approval of the entire incinerator system, including process feed and air emissions control units. Additionally, NOx emissions are specifically limited by Clean Air Act stationary source permit requirements. Since both of these permits are issued on an individual facility basis, allowing individualized process controls, and since EPA lacks adequate data to dictate realistic NOx control system design, EPA agrees with this commenter and chooses not to mandate air emissions control for organonitrogen incineration systems. Permit-by-permit determinations under the RCRA omnibus authority may be the most appropriate air emissions control regulation for facilities burning these wastes. RCRA Section 3005(c)(3) states that "each permit issued under this section shall contain such terms and conditions as the Administrator (or the State) determines necessary to protect human health and the environment." EPA intends to provide guidance to permit writers with respect to facilities burning these wastes.

Comment Number: 46-Ci-1

Docket Number: LD12-L0006

Commenter: GREAT LAKES CHEMICAL CORPORATION

Issue: ISSUE CODE 46: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: Brominated Compounds

Comment:

Further, GLCC strongly opposes the proposed BDAT standards for wastewaters on page 48467 pertaining to 1,2-dibromethane (0.016 mg/L) and bromomethane (0.065 mg/L). The background information for the basis of these low levels given in Section III.A.1.h.(6)(b) as being that in the scrubber discharge following incineration. There is a shortage of incineration capacity to handle brominated waste. This shortage is because the technology is expensive and very difficult due to the corrosivity of bromine combustion products.

GLCC proposes that 16 mg/L be adopted for brominated waste constituents as for the U- and P- wastes given in section III.A.2.(e).

Due to a remediation project at its El Dorado facility, groundwater contaminated with brominated constituents will have to be disposed of via deep well. The anticipated disposal capacity needed for this is in the range of 250MM is 500MM gallons per year.

Treatment of this groundwater to levels described above is tentatively believed to be unachievable, and incineration is not an alternative due to the large volumes of water.

Comment Number: 46-Ci-1

Docket Number: LD12 - L0006

Commenter: Great Lakes Chemical Corporation

Issue: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: Brominated Compounds

Response:

The commenter opposes the proposed concentration-based BDAT wastewater treatment standards of 0.016 mg/L for U067 (1,2-dibromomethane) and 0.065 mg/L for U029 (bromomethane), as developed from incinerator scrubber water data, because there is a shortage of incineration capacity to handle brominated waste. The commenter proposes that 16 mg/L be adopted for brominated U and P wastewater constituents.

The proposed treatment standards cited by the commenter were based on multi-source leachate treatment data, not on incineration scrubber water data. The promulgated wastewater treatment standards are 0.11 mg/L for U029 and 0.028 mg/L for U067, based on additional multi-source leachate data submitted by industry. Specifically, the BDAT treatment standard for U029 wastewater is based on data from activated sludge treatment, and the BDAT treatment standard for U067 wastewater is based on data from air stripping. See Volume A of the U & P Wastes and Multi-Source Leachates background document for more information on the development of these treatment standards.

As with any concentration-based BDAT treatment standard, facilities have the option of using any treatment technology, as long as it effectively treats the waste to at or below the treatment standard. As a result, the commenter's perceived shortage of incineration capacity for brominated wastes is irrelevant to the treatment of U029 and U067 wastewaters.

Comment Number: 46-Cii-1

Docket Number: LD12-00059

Commenter: WASTE MANAGEMENT, INC. and CHEMICAL WASTE MANAGEMENT, INC.

Issue: ISSUE CODE 46: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: Brominated Compounds

Comment:

IX. Treatment Standards for Specific Listed Wastes

A. Brominated Organics (54 Fed. Reg. at 48,402)

The impact of feeding brominated compounds to most incineration devices is evident by the coloration of the plume. In certain instances, permit requirements for opacity monitoring preclude burning of brominated organic streams. It must be recognized that lab packs may contain small quantities of brominated compounds which are best handled by the incineration process (U029-Methyl Bromide is not included in the Appendix IV-Organic Lab Packs listing).

The preamble currently recognizes that to burn ethylene dibromide wastes may require certain operating conditions to prevent the release of toxic bromine gas. Applying the appropriate operational controls results in a soluble bromide compound which can be removed by a scrubber system.

WMI recommends that brominated feeds to incineration devices be limited to lab pack quantities or, for large quantities, addressed as part of a RCRA trial burn.

Comment Number: 46-Cii-1

Docket Number: LD12 - 00159

Commenter: Waste Management, Inc. and Chemical Waste Management, Inc.

Issue: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: Brominated Compounds

Response:

Based on air emission problems related to incineration of brominated wastes, the commenter recommends that brominated feeds to incineration devices be limited to lab pack quantities, or, for large quantities, addressed as part of a RCRA trial burn.

Treatment performance data from a test burn of ethylene dibromide waste were used to calculate concentration-based BDAT treatment standards for nonwastewater forms of brominated wastes. Multi-source leachate data were used to calculate concentration-based BDAT treatment standards for wastewater forms of brominated wastes. As such, the commenter's concern is relevant only to brominated U and P nonwastewater constituents. See Volumes A and C of the U & P Wastes and Multi-Source Leachates background document for information on the development of these treatment standards.

In the proposed rule, the Agency solicited comment on several process design and air emissions control issues unique to bromine incineration. The Agency particularly wanted information indicating whether treatment standards promulgated in this rule should mandate a maximum bromine concentration in the feed to the incinerator and the use of air emissions control devices. Unfortunately, neither this commenter nor any other commenters provided substantive data on which EPA could base nonwastewater treatment standard changes. Specifically, no commenters provided the process design or emissions control information EPA solicited in light of bromine's unique corrosive properties. Consequently, EPA is promulgating nonwastewater standards as proposed.

The Agency does believe that control of the undesirable conversion of the bromine-containing waste to bromine gas significantly affects the design and operation of individual incineration systems. As a result, potential air emission problems will need to be addressed on a facility-specific basis, independent of the treatment standards. The RCRA permitting procedure requires Regional or State approval of the entire incinerator system, including process feed as well as air emission control units. Comprehensive, facility-specific RCRA trial burns are required during this permitting process. As a result, EPA agrees with the commenter and intends to deal with the problem of air emissions from burning brominated wastes on a permit-by-permit basis through the use of the RCRA omnibus permit authority.

Comment Number: 46-Ciii-1

Docket Number: LD12-00179

Commenter: THE DOW CHEMICAL COMPANY

Issue: ISSUE CODE 46: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: Brominated Compounds

Comment:

XX. EPA SHOULD NOT, UNDER THE LAND DISPOSAL RESTRICTIONS PROGRAM, IMPOSE DETAILED OPERATIONAL REQUIREMENTS ON HAZARDOUS WASTE INCINERATORS.

54 Fed. Reg. 48,403, 48,417, 48,501

In the preamble to the Third Third proposal, EPA has expressed several concerns about air emissions that may result from treatment of wastes using technologies that have been identified as BDAT. See, e.g., 54 Fed. Reg. 48,501. In particular, the Agency has expressed concern "whether incineration of brominated organics or organo-nitrogen compounds may adversely affect air quality." 54 Fed. Reg. 48,502. Dow believes that these concerns, to the extent they are valid, are best addressed in the context of the Clean Air Act regulatory program or other aspects of the RCRA program.

EPA asserts that incineration of brominated organics may lead to "the release of toxic bromine gas." 54 Fed. Reg. 48,403. In order to avoid this perceived problem, the Agency has proposed a number of alternative control strategies, including requiring the addition sulfur whenever brominated compounds are burned and limiting the amount of bromine that can be burned in an incinerator. Id. These approaches, however, pose substantial implementation problems because, as EPA recognized, "different incinerators have different designs" that may warrant different controls. Id. Moreover, addition of sulfur may create new environmental problems such as the release into the air of sulfur dioxide. Dow believes that EPA's concerns can be better addressed through mechanisms other than the land disposal restrictions program.

EPA also expresses concern about the potential nitrogen and sulfur emissions generated from the incineration of organosulfur compounds. According to the Agency, "[t]he formation of nitrogen or sulfur oxides in the process of incinerating any of these compounds may require additional controls in order to meet air quality requirements pursuant to Section 108, 110 and 111 of the Clean Air Act or New Source Review under the CAA's Prevention of Significant Deterioration program." 54 Fed. Reg. 48,417. Given the fact that nitrogen and sulfur oxides are currently regulated under the Clean Air Act, Dow sees no reason why these concerns cannot be addressed under that statute. Indeed, Dow believes that EPA is obliged to use its authority under the Clean Air Act rather than its authority under RCRA Subtitle C. RCRA section 1006(b) explicitly directs EPA to "avoid duplication, to the maximum extent practicable, with the appropriate provisions of the Clean Air Act."

Comment Number: 46-Ciii-1

Docket Number: LD12 - 00179

Commenter: The Dow Chemical Company

Issue: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: Brominated Wastes

Response:

The commenter believes that air emission concerns associated with the incineration of brominated compounds are best addressed under the Clean Air Act and other aspects of the RCRA program.

The Agency agrees with the commenter, and is leaving responsibility for air quality at hazardous waste treatment facilities to the RCRA permitting process under 40 CFR 264 and 270.

The proposed rule solicited comment on several air emissions-related technical problems and regulatory issues anticipated to complicate the incineration of brominated wastes. Issues of particular interest were operating conditions needed to ensure adequate bromine oxidation and the need for air pollution control devices. EPA particularly wanted information indicating whether treatment standards promulgated in this rule should mandate a maximum bromine concentration in the feed to the incinerator and the use of air emissions control devices.

EPA received no substantive comments on the proposed bromine standards. Specifically, commenters did not provide the process design or emissions control information that EPA solicited, in light of bromine's unique corrosive properties.

EPA is promulgating nonwastewater standards as proposed without specifying specific air emissions controls. EPA continues to believe that combustion of these wastes could pose risks from air emissions at particular facilities. The Agency, however, is unable to resolve these concerns at this rulemaking. Since any problem might be site-specific, EPA believes, given current limitations, that the best way to evaluate and control potential problems with objectionable air emissions from burning brominated wastes is a permit-by-permit approach through the use of the omnibus permit authority in Section 3005(c)(3).

Comment Number: 46-Di-1

Docket Number: LD12-00179

Commenter: THE DOW CHEMICAL COMPANY

Issue: ISSUE CODE 46: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: Treatment Methods as Treatment Standards

Comment:

X. USE OF INDICATOR PARAMETERS TO EVALUATE THE EFFECTIVENESS OF TREATMENT.

54 Fed. Reg. 48,391

The use of indicator parameters is a complex problem. In general, it is very difficult to identify indicator parameters (TOC, COD, BOD, etc.) for specific chemicals. However, if one considers a specific treatment system and a specific waste stream, such indicators can often be found. For example, if one is using a carbon adsorbtion system, it is easy to identify the component of the waste stream which will break through first. If that component is not present in the effluent, neither is anything else. All of Dow's biological treatment systems have a difficult-to-treat chemical, such as a phenol, which serves as an excellent indicator of the health of the system and thus the effectiveness of the treatment. EPA should therefore allow use of indicator parameters selected on a site specific basis. This approach should be implemented through the permitting process or a related process. Where such indicators are selected, compliance with treatment standards for the indicators should be deemed compliance with the Land Disposal restrictions program.

Comment Number: 46-Di-1

Docket Number: LD12 - C0179

Commenter: The Dow Chemical Company

Issue: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur, and Organo-Nitrogen Compound Wastes

Subissue: Treatment Methods as Treatment Standards

Response:

The commenter suggests that EPA allow the use of indicator parameters selected on a site-specific basis as a measure of treatment system effectiveness.

In the proposed rule, EPA solicited data demonstrating the feasibility of regulating TOC or COD as a surrogate for nonanalyzable U and P wastewater constituents. By setting a concentration-based treatment standard on the TOC or COD level of a waste to be land-disposed, EPA would then necessarily limit the concentration of all constituents in that waste. No supporting data were submitted, by this or any other commenter, demonstrating that TOC or COD could be reliable surrogates to ensure the treatment of nonanalyzable U and P wastes. Consequently, EPA is not promulgating concentration-based standards for U and P wastes using TOC or COD as surrogates. However, the Agency is currently investigating the potential use of other surrogates/indicators that could be used in future rulemakings.

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omment Number: 46-Di-2

Docket Number: LD12-L0007

Commenter: Chemical Manufacturers Association

Issue: ISSUE CODE 46: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: Treatment Methods as Treatment Standards

Comment:

E. CMA Believes That Selected Surrogate Chemical Analyses (e.g., COD, TOC) Can Be Used as BDAT Standards for Unanalyzable Constituents in Certain Wastewaters, But This Would Have To Be Done on a Plant-Specific Basis. The Rules Should Provide That Such Approaches May Be Used To Demonstrate That BDAT Is Achieved When a Facility Cannot Analyze for the Hazardous Constituents of Concern.

EPA is considering surrogate/indicator analytical parameters (e.g., TOC, COD, and BOD) to determine which treatment technologies perform the best for "U" and "P" constituents in wastewaters (54 Fed. Reg. at 48,391/2). These surrogates or indicators will be used primarily for hazardous constituents for which data are not readily available to demonstrate the effectiveness of typical wastewater treatment processes.

Although CMA believes that parameters such as BOD, COD, and TOC are useful for comparing the relative performance of different treatment technologies on the same wastewater, studies have shown that they are not useful for assessing the treatment of individual chemical constituents except on a plant-specific basis. For example, when EPA developed the effluent limitations guidelines for the petroleum refining point source category, it collected two sets of long-term

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Comment Number: 46-Di-2 (Continued)

Docket Number: LD12-L0007

Commenter: Chemical Manufacturers Association

Issue: ISSUE CODE 46: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: Treatment Methods as Treatment Standards

Comment:

effluent quality data which it statistically analyzed for surrogate-pollutant relationships. In the final Development Document (EPA 440/1-82/014), the Agency states that:

> The 30-day samples from 2 plants were statistically analyzed to determine if surrogates for important pollutants could be found. Surrogates were sought for five pollutants: priority pollutant (PP) organics, total organics (PP organics plus Appendix C alkanes), extractables, PP metals, and total metals (PP metals plus a set of nonconventional metals). Seven potential surrogates were: BOD, COD, total phenol (4AAP), TOC, TSS, oil and grease, and chromium. To be acceptable, a surrogate must demonstrate a statistically significant correlation with the pollutant and it must allow the level of the pollutant to be estimated with satisfactory accuracy.
>
> . . .Only two possible surrogates were identified, namely total phenol (4AAP) for PP organics and total organics, and chromium for PP metals and total metals. However, as can be seen from Table V-32, statistical significance was obtained only in one plant. Because surrogate adequacy must be consistent across plants, the relationship was found to be invalid. In addition, the predictive adequacy, even for the single plant, is not sufficient to allow practical application of these two surrogates. (EPA 440/1-82/014, pages 73-74).

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Comment Number: 46-Di-2 (Continued)

Docket Number: LD12-L0007

Commenter: Chemical Manufacturers Association

Issue: ISSUE CODE 46: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: Treatment Methods as Treatment Standards

Comment:

In a 1980 study, CMA evaluated the potential for using several nonconventional pollutants as indicators for the organic priority pollutants (Engineering-Science, Inc., A Technical Analysis of the Building Block for Effluent Limitations Guidelines, November 1980). Organic priority pollutant removal in chemical plant wastewaters by biological treatment was compared to BOD, COD, and TSS removals and effluent concentrations. None of these constituents proved a practical surrogate for individual toxic constituents in the wastewater, on a generic basis. Excerpts from this report, showing the indicator pollutant analyses, are included as Appendix 1 to these comments.

CMA supports the Agency's suggestion that a treater develop a testing protocol for EPA review, as an amendment to their waste analysis plan. At an individual facility, a treater may be able to demonstrate that any or all of these wastewater treatment parameters satisfactorily measure a particular wastewater treatment technology or sequence. EPA should not, however, impose use of surrogates in a nationally-applicable rule.

Comment Number: 46-Di-2

Docket Number: LD12 - L0007

Commenter: Chemical Manufacturers Association

Issue: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur, and Organo-Nitrogen Compound Wastes

Subissue: Treatment Methods as Treatment Standards

Response:

The commenter suggests that EPA allow the use of indicator parameters selected on a site-specific basis as a measure of treatment system effectiveness.

In the proposed rule, EPA solicited data demonstrating the feasibility of regulating TOC or COD as a surrogate for nonanalyzable U and P wastewater constituents. By setting a concentration-based treatment standard on the TOC or COD level of a waste to be land-disposed, EPA would then necessarily limit the concentration of all constituents in that waste. No supporting data were submitted, by this or any other commenter, demonstrating that TOC or COD could be reliable surrogates to ensure the treatment of nonanalyzable U and P wastes. Consequently, EPA is not promulgating concentration-based standards for U and P wastes using TOC or COD as surrogates. However, the Agency is currently investigating the potential use of other surrogates/indicators that could be used in future rulemakings.

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Comment Number: 46-Dii-1

Docket Number: LD12-00145

Commenter: CHEMICAL MANUFACTURERS ASSOCIATION

Issue: ISSUE CODE 46: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: Treatment Methods as Treatment Standards

Comment:

I. Indicator/Surrogate Analytical Parameters Are of Limited Utility on a Generic Basis And Not Necessary For Phenolic Wastes

EPA states that most U and P wastewaters are generated at relatively few facilities and limited data has impeded the identification of treatment technologies the performance of which might be considered best. See 54 Fed. Reg. at 48391 (col. 2). EPA is thus considering the use of surrogate/indicator analytical parameters, including among others COD, BOD, and TOC, to assess the performance of particular wastewater treatment technologies or a sequence of such technologies.

The Panel believes the use of parameters such as BOD and COD are useful for the limited purpose of comparing the relative performance of different treatment technologies with respect to the same wastewaters. Panel members believe, however, and it is generally agreed that surrogate parameters are not useful for purposes of assessing on a generic basis the treatment of specific chemical constituents. The Panel thus agrees with EPA that the best way to assess the utility of any surrogate is by limiting application to a case-specific basis through an individual facility's waste analysis plan. See 54 Fed. Reg. at 48391 (col. 3).

Moreover, the Panel believes it is unnecessary to establish surrogate analytical parameters for phenolic wastewaters.

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Comment Number: 46-Dii-1 (Continued)

Docket Number: LD12-00145

Commenter: CHEMICAL MANUFACTURERS ASSOCIATION (continued)

Issue: ISSUE CODE 46: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: Treatment Methods as Treatment Standards

Comment:

Analytical methods already exist that are capable of assuring that phenolic compounds are detected in wastewater. For example, Method 8040, included in the Test Methods For Evaluating Solid Waste (SW-846) (Third Ed. 1987), can detect 17 phenolic compounds. The detection limit for phenol in Method 8040 is 0.14 micrograms per liter ("ug/l"), with a practical quantitation limit factor of 10 for phenolics found in groundwater.

Phenolic compounds do not appear difficult to analyze, and analytical methods in use today are capable of demonstrating the effectiveness of a wastewater treatment technology. Accordingly, use of indicator parameters with respect to phenolic wastewaters does not appear necessary. If, however, EPA believes otherwise, the Panel urges EPA not to require the use of such parameters, but rather allow their use, as necessary, on a limited, plant-specific basis.

Comment Number: 46-Dii-1

Docket Number: LD12 - 00145

Commenter: Chemical Manufacturers Association

Issue: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur, and Organo-Nitrogen Compound Wastes

Subissue: Treatment Methods as Treatment Standards

Response:

In the proposed rule, EPA solicited data demonstrating the feasibility of regulating TOC or COD as a surrogate for nonanalyzable U and P wastewater constituents. By setting a concentration-based treatment standard on the TOC or COD level of a waste to be land-disposed, EPA would then necessarily limit the concentration of all constituents in that waste. No supporting data were submitted, by this or any other commenter, demonstrating that TOC or COD could be reliable surrogates to ensure the treatment of nonanalyzable U and P wastes. Consequently, EPA is not promulgating concentration-based standards for U and P wastes using TOC or COD as surrogates. However, the Agency is currently investigating the potential use of other surrogates/indicators that could be used in future rulemakings.

EPA agrees that indicator parameters are inappropriate for phenolics, since they are easily quantified with several SW-846 analytical methods. As a result, the Agency is promulgating concentration-based treatment standards for the majority of phenolics.

Comment Number: 46 - Diii-1

Docket Number: LD12-00190

Commenter: UNION CARBIDE CHEMICALS AND PLASTIC COMPANY, INC.

Issue: ISSUE CODE 46: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: Treatment Methods as Treatment Standards

Comment:

8) **Treatment Standards for 82 Non-halogenated Wastewaters** - The Agency should avoid the linkage of two technologies (eg. carbon adsorption to oxidation or biodegradation) because they are unnecessary, redundant and too restrictive. Many wastewater systems operate well, with complete removal of compounds, using either oxidation/degradation or carbon adsorption alone.

Comment Number: 46-Diii-1

Docket Number: LD12 - 00190

Commenter: Union Carbide

Issue: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur, and Organo-Nitrogen Compound Wastes

Subissue: Treatment Methods as Treatment Standards

Response:

The commenter opposes the combined use of carbon adsorption with chemical or wet air oxidation as the BDAT treatment standard for unquantifiable U and P wastewaters. The commenter argues that carbon adsorption, chemical oxidation, and wet air oxidation are treatment technologies which, independently, can effectively treat these wastes.

The wastewater treatment technology that will provide the best level of treatment for organic-bearing wastewater is highly dependent upon the organic constituents present and their influent concentrations. The wastewater treatment technologies discussed by this and other commenters can all indeed perform well alone for specific wastewater matrices. However, for the nonanalyzable U and P wastewaters, EPA does not have representative waste characterization data that defines this matrix, nor are total effluent concentration data available. Therefore, EPA cannot confidently establish a BDAT treatment standard as a method of treatment as one of these technologies alone. The possibility that substantial amounts of the organic constituent in the U or P wastewater will pass through to the effluent untreated by the single specified technology is too great. As a result, when EPA has established BDAT treatment standards as methods of treatment for organics in wastewaters, EPA prefers to take a conservative approach of specifying a treatment train. This treatment train approach ensures adequate treatment of organic constituents prior to disposal.

The Agency does not dispute the claim that chemical oxidation and wet air oxidation provide substantial treatment of unquantifiable organic U and P wastewaters. EPA believes, however, that since these constituents are unquantifiable, and therefore it is not possible to accurately judge the effectiveness of wet air oxidation and chemical oxidation, it is sound engineering judgment to include a final step of carbon adsorption following oxidation. This will ensure that any untreated organic constituents are removed from the wastewater matrix. Additionally, spent carbon from treating these wastewaters becomes a nonwastewater form of this waste (54 Federal Register 26630-1, June 23, 1989) and thus must be incinerated. EPA believes that incineration is the most successful method of treatment for a wide variety of organic wastes, and therefore is including carbon adsorption in the oxidation treatment train to ensure ultimate destruction of the U and P wastes present in the wastewater.

Comment Number: 46-Diii-2

Docket Number: L012-00128

Commenter: Vulkan Materials Company

Issue: ISSUE CODE 46: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: Treatment Methods as Treatment Standards

Comment:

Technologies for Halogenated Wastewaters

The Agency has identified twenty-five specific halogenated organic wastes and proposed three treatment technologies as alternative BDAT standards. The three technologies are: Wet air oxidation followed by carbon absorption; Chemical oxidation followed by carbon absorption; and Incineration of wastewaters. While we do not object to the three technologies, we believe that the use of carbon absorption to remove halogenated organics from wastewaters is demonstrated technology and were surprised that the Agency did not include this technology for the treatment of halogenated wastewaters. If the generator can attain the concentration-based treatment standards using only carbon absorption, then he should be allowed to utilize this technology and be spared the cost of installing unnecessary wet air oxidation or chemical oxidation systems upstream of the carbon absorption unit.

Comment Number: 46-Diii-2

Docket Number: LD12 - 00128

Commenter: Vulcan Materials Company

Issue: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur, and Organo-Nitrogen Compound Wastes

Subissue: Treatment Methods as Treatment Standards

Response:

The commenter opposes the combined use of carbon adsorption with chemical or wet air oxidation as the BDAT treatment standard for unquantifiable halogenated U and P wastewaters. The commenter argues that carbon adsorption is a treatment technology which, independently, can effectively treat these wastes.

The Agency believes that the best technologies for treating unquantifiable U and P wastewaters are those technologies that completely destroy the organic constituents in U and P wastes, such as incineration, chemical oxidation, and wet air oxidation. Carbon adsorption is a technology which removes the organic constituents from a wastewater stream; however, the waste constituents are not destroyed but rather transferred to a more concentrated waste, eg. the carbon bed. This waste would require further treatment prior to disposal. As a result, the Agency does not consider carbon adsorption (used by itself) to be the best technology for treating unquantifiable U and P wastewaters.

This does not necessarily preclude carbon adsorption from being considered part of a BDAT treatment train for quantifiable analyses, provided concentration-based BDAT treatment standards are met. The Agency has determined that chemical oxidation and wet air oxidation provide substantial treatment of unquantifiable organic U and P wastewaters; however, since the organic constituents are unquantifiable, and therefore it is not possible to accurately judge the effectiveness of wet air oxidation and chemical oxidation, these destruction technologies alone may not completely destroy the organic constituents in U and P wastes, nor their degradation products. EPA believes, therefore, that it is sound engineering judgment to include a final step of carbon adsorption following oxidation. This will ensure that these remaining organic constituents are removed from the wastewater matrix. Additionally, spent carbon from treating these wastewaters becomes a nonwastewater form of this waste (54 Federal Register 26630-1, June 23, 1989) and thus must be incinerated. EPA believes that incineration is the most successful method of treatment for a wide variety of organic wastes, and therefore is including carbon adsorption in the oxidation treatment train for unquantifiable analytes to ensure ultimate destruction of the regulated constituents present in the U and P wastewaters.

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Comment Number: 46-Diii-3

Docket Number: 1-D12-00138

Commenter: OCCIDENTAL CHEMICAL CORPORATION

Issue: ISSUE CODE 46: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: Treatment Methods as Treatment Standards

Comment:

B. EPA Has Proposed Alternate BDAT Standards for Eighty-Two "U" and "P" Wastewaters That Require Using Wet Air Oxidation Followed by Activated Carbon, Chemical Oxidation Followed by Activated Carbon, or Biological Treatment Followed by Activated Carbon. For Some of These Wastes, the Activated Carbon Treatment Step Is Inappropriate Since The Hazardous Constituents Being Treated Are Either Completely Removed by the Initial Phase of Treatment and/or Activated Carbon Will Not Effectively Remove the Constituent.

As EPA states (54 Fed. Reg. 48393), the Agency is proposing methods of treatment as standards for certain nonhalogenated "U" and "P" wastewaters. This is being done for those wastes that cannot be readily analyzed in wastewaters, and for which EPA does not have adequate treatability data. There are eighty-tow of these wastes. The specified technologies are: (1) wet air oxidation followed by carbon adsorption; (2) chemical oxidation followed by carbon adsorption; (3) biodegradation followed by carbon adsorption; and (4) incineration.

EPA states that it has specified carbon adsorption as part of the first three treatment technologies because the eighty-two nonhalogenated "U" and "P" organics are "believed" to be adsorbable when present in low concentrations, as would be present in the effluents from the wet air oxidation, chemical oxidation, and biodegradation processes. OxyChem believes that for many of these chemicals, the specification of activated carbon as a polishing step is unnecessary to treat to detection limit levels, is ineffective for removing the compound, and is therefore not demonstrated technology.

All of these chemicals have certain properties in common that assure that activated carbon adsorption would be an unacceptable treatment method: they have short carbon chains and they are polar. These properties give them high aqueous solubilities, which predispose them to poor carbon adsorption properties. There are a number of chemical with similar properties that EPA has included in its list of eighty-two "U" and "P" wastes that require activated carbon as polishing treatment.

TLR-WP5
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Comment Number: 46-Dii-3 (Continued)

Docket Number: LD12-00138

Commenter: OCCIDENTAL CHEMICAL CORPORATION (continued)

Issue: ISSUE CODE 46: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: Treatment Methods as Treatment Standards

Comment:

EPA must review its list of "U" and "P" wastes for which it has specified these treatment technologies and should ascertain which chemicals will be completely removed by the first-stage treatment technologies it has specified and, for those that are not completely removed, whether or not carbon adsorption is an effective treatment technology for additional removal. For those chemicals that are treated effectively by wet air oxidation, chemical oxidation and/or biodegradation, no second stage carbon treatment is required and none should be specified as BDAT. For those chemicals for which it is questionable as to the level of treatment that one of these three processes will provide, EPA should apply activated carbon adsorption theory and any performance data that are available to determine whether or not carbon will be effective in removing residual concentrations of the target chemical. Automatic specification of carbon as add-on wastewater treatment technology is not demonstrated treatment for many organic chemicals.

Comment Number: 46-Diii-3

Docket Number: LD12 - 00138

Commenter: Occidental Chemical Corporation

Issue: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur, and Organo-Nitrogen Compound Wastes

Subissue: Treatment Methods as Treatment Standards

Response:

The commenter opposes the combined use of carbon adsorption with chemical or wet air oxidation as the BDAT treatment standard for unquantifiable U and P wastewaters. The commenter argues that carbon adsorption alone can not effectively remove the constituents of concern in these wastes.

The Agency believes that the best technologies for treating unquantifiable U and P wastewaters are those technologies that completely destroy the regulated constituents in U and P wastes, such as incineration, chemical oxidation, and wet air oxidation. As a result, the Agency does not consider carbon adsorption (used by itself), a removal technology, to be the best technology for treating unquantifiable U and P wastewaters.

This does not necessarily preclude carbon adsorption from being considered part of a BDAT treatment train incorporating a more aggressive technology up front. The Agency has determined that chemical oxidation and wet air oxidation provide substantial treatment of unquantifiable organic constituents in U and P wastewaters; however, since these constituents are unquantifiable, and therefore it is not possible to accurately judge the effectiveness of wet air oxidation and chemical oxidation, these destruction technologies alone may not completely treat the regulated organics in U and P wastes. EPA believes, therefore, that it is sound engineering judgment to include a final step of carbon adsorption following oxidation. This will ensure that remaining organic constituents are removed from the wastewater matrix. The Agency believes that carbon adsorption is the most appropriate removal technology for the widest range of organic compounds likely to be present in the oxidation effluent stream.

Additionally, spent carbon from treating these wastewaters becomes a nonwastewater form of this waste (54 Federal Register 26630-1, June 23, 1989) and thus must be incinerated. EPA believes that incineration is the most successful method of treatment for a wide variety of organic wastes, and therefore is including carbon adsorption in the oxidation treatment train to ensure ultimate destruction of the regulated constituents present in the U or P wastewaters.

Comment Number: 46-Diii-4

Docket Number: LD12-00242

Commenter: Merck & Co. Inc.

Issue: ISSUE CODE 46: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: Treatment Methods as Treatment Standards

Comment:

For many of the U- and P-listed wastes the Agency has proposed a treatment standard of wet air oxidation (or chemical oxidation) followed by activated carbon, biodegradation followed by activated carbon, or incineration. We feel that the activated carbon is an unnecessary and burdensome form of treatment. For our facilities, U- and P-listed wastewaters are typically generated from the spill of a raw material into the chemical sewer which goes to either on-site pretreatment or an on-site wastewater treatment plant. Pharmaceutical plants discharge millions of gallons of water daily and in the event of a spill, it would be impractical as well as prohibitively expensive to filter all discharges through activated carbon. Discharges from wastewater treatment systems are regulated under NPDES and discharges to POTWs are regulated through pretreatment agreements as well as NPDES permits. These systems that are already in place are protective of human health and the environment and as long as these discharges are within permit limitations, they should be allowed without requiring carbon filtration.

Comment Number: 46-Diii-4

Docket Number: LD12 - 00242

Commenter: Merck & Co. Inc.

Issue: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur, and Organo-Nitrogen Compound Wastes

Subissue: Treatment Methods as Treatment Standards

Response: The commenter opposes the combined use of carbon adsorption with chemical or wet air oxidation as the BDAT treatment standard for unquantifiable U and P wastewaters. The commenter argues that carbon adsorption is unnecessary.

Industrial wastewaters that are subject to the Clean Water Act and are hazardous under RCRA are subject to RCRA Subtitle C hazardous waste management regulations prior to discharge. The land disposal restrictions would only apply to such wastes if and when land disposal, as defined in 40 CFR 268.2, occurs. Absent placement in or on the land, as in the example given by the commenter, the treatment standards would not apply.

However, when land disposal does occur, the Agency has determined that chemical oxidation and wet air oxidation provide substantial treatment of unquantifiable organic constituents in U and P wastewaters; however, since these constituents are unquantifiable, and therefore it is not possible to accurately judge the effectiveness of wet air oxidation and chemical oxidation, these destruction technologies alone may not completely treat the regulated constituents in the U and P wastes. EPA believes, therefore, that it is sound engineering judgment to include a final step of carbon adsorption following oxidation. This will ensure that remaining organic constituents are removed from the wastewater matrix. The Agency believes that carbon adsorption is the most appropriate removal technology for the widest range of organic compounds likely to be present in the oxidation effluent stream.

Additionally, spent carbon from treating these wastewaters becomes a nonwastewater form of this waste (54 Federal Register 26630-1, June 23, 1989) and thus must be incinerated. EPA believes that incineration is the most successful method of treatment for a wide variety of organic wastes, and therefore is including carbon adsorption in the oxidation treatment train to ensure ultimate destruction of the regulated constituents present in the U and P wastewaters.

Finally, biological treatment is not being promulgated as a technology-based BDAT treatment standard for unquantifiable organic U and P wastewaters, because concentrations of these wastes in the influent to the biological treatment unit cannot be measured. Therefore, the treatment unit operators cannot control the levels of these wastes reaching the working organisms in the biological treatment unit. The risk of sending unmeasurable quantities of these wastes to a biological treatment unit includes the possibility of shock loads that would disable the plant's working organisms. This would allow these and other wastes to exit untreated in the effluent until the biological treatment system could be restored to working order.

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Comment Number: 46 - Diii - 5

Docket Number: LD12 - L0007

Commenter: Chemical Manufacturers Association

Issue: ISSUE CODE 46: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: Treatment Methods as Treatment Standards

Comment:

G. EPA Has Proposed Alternate BDAT Standards for Eighty-Two "U" and "P" Wastewaters That Require Using Wet Air Oxidation Followed by Activated Carbon, Chemical Oxidation Followed by Activated Carbon, or Biological Treatment Followed by Activated Carbon. For Some of These Wastes, the Activated Carbon Treatment Step Is Inappropriate Since the Hazardous Constituents Treated Are Either Completely Removed by the Initial Phase of Treatment and/or Not Effectively Removed by Activated Carbon.

As EPA states in section III.A.2.a.(4) (54 Fed. Reg. at 48,393), the Agency is proposing methods of treatment as standards for eighty-two nonhalogenated "U" and "P" wastewaters. This is being done for those wastes that cannot be readily analyzed in wastewaters, and for which EPA therefore does not have adequate treatability data. The specified technologies are: (1) wet air oxidation followed by carbon adsorption; (2) chemical oxidation followed by carbon adsorption; (3) biodegradation followed by carbon adsorption; and (4) incineration.

EPA states that it has specified carbon adsorption as part of each of the first three treatment technologies because the eighty-two nonhalogenated "U" and "P" organics are "believed" to be absorbable when present in low concentrations, as would be present in the effluents from the wet air oxidation, chemical oxidation, and biodegradation processes. CMA believes that for many of these chemicals, the specifying activated carbon as a polishing step is unnecessary to treat to detection limit levels, is ineffective for removing the compound, and should not be demonstrated technology.

cont.

Comment Number: 46 - Diii - 5 (continued)
Docket Number: LD12 - L0007
Commenter: Chemical Manufacturers Association
Issue: ISSUE CODE 46. Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes
Subissue: Treatment Methods as Treatment Standards
Comment:

A few examples of chemicals that fit this characterization will demonstrate the inadequacy of the Agency's technology evaluation. In the oxygenated hydrocarbons and heterocyclics group (54 Fed. Reg. at 48,413), acetaldehyde (U001), formaldehyde (U122), formic acid (U123), and methanol (U154) are assigned to the BDAT standard category that requires that one of the above four treatment technologies be applied. Each of these chemicals is highly biodegradable and is poorly absorbed on activated carbon (Verschueren, K.,1983, Handbook of Environmental Data on Organic Chemicals, 2d edition, Van Nostrand Reinhold Company, New York; Guisti, D.M., Conway, R.A., and Lawson, "Activated Carbon Adsorption of Petrochemicals," Journal of the Water Pollution Control Federation, 46, 5, pp. 947-964). For example, carbon adsorption tests on methanol, formaldehyde, formic acid, and acetaldehyde had adsorption efficiencies at a 1000 mg/l initial aqueous concentration of 3.6, 9.2, 23.5, and 11.9 percent, respectively (Table 1, Guisti, et. al.). Carbon adsorption effectiveness also decreases at lower initial concentrations (Weber, W.J., 1972, Physiochemical Processes for Water Quality Control, Wiley-Interscience, New York). If a chemical compound is not absorbable at high concentrations, it cannot possibly be more absorbable at low concentrations and, thus, carbon adsorption should never be considered a demonstrated treatment technology.

cont.

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Comment Number: 46 - Diii - 5 (Continued)

Docket Number: LD12 - L0007

Commenter: Chemical Manufacturers Association

Issue: ISSUE CODE 46: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: Treatment Methods as Treatment Standards

Comment:

All of these chemicals have short carbon claims and are polar, properties that hinder activated carbon adsorption. (Weber, op.cit.). These properties give them high aqueous solubilities, which predispose them to poor carbon adsorption properties. There are a number of chemicals with similar properties that EPA has included in its list of eighty-two "U" and "P" Chemicals requiring activated carbon as polishing treatment.

EPA should review its list of "U" and "P" chemicals for which it has specified these treatment methodologies and should ascertain which chemicals will be completely removed by the first-stage treatment technologies it has specified and, for those that are not completely removed, whether or not carbon adsorption is a reasonably effective treatment technology for additional removal. For those chemicals that are treated effectively by wet air oxidation, chemical oxidation, and/or biodegradation, no second stage carbon treatment is beneficial and none should be specified as BDAT. For those remaining chemicals, EPA should apply activated carbon adsorption theory and any available performance data to determine whether or not activated carbon will effectively remove residual concentrations of the target chemical before specifying it as BDAT.

Comment Number: 46-Diii-5

Docket Number: LD12 - L0007

Commenter: Chemical Manufacturers Association

Issue: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur, and Organo-Nitrogen Compound Wastes

Subissue: Treatment Methods as Treatment Standards

Response:

The commenter opposes the combined use of carbon adsorption with chemical or wet air oxidation as the BDAT treatment standard for unquantifiable U and P wastewaters. The commenter argues that carbon adsorption can not effectively remove the constituents of concern in these wastes.

The Agency believes that the best technologies for treating unquantifiable U and P wastewaters are those technologies that completely destroy the regulated constituents in U and P wastes, such as incineration, chemical oxidation, and wet air oxidation. As a result, the Agency does not consider carbon adsorption (used by itself), a removal technology, to be the best technology for treating unquantifiable U and P wastewaters.

This does not necessarily preclude carbon adsorption from being considered part of a BDAT treatment train. The Agency has determined that chemical oxidation and wet air oxidation provide substantial treatment of unquantifiable organic constituents in U and P wastewaters; however, since these constituents are unquantifiable, and therefore it is not possible to accurately judge the effectiveness of wet air oxidation and chemical oxidation, these destruction technologies alone may not completely treat the regulated organics in U and P wastes. EPA believes, therefore, that it is sound engineering judgment to include a final step of carbon adsorption following oxidation. This will ensure that remaining organic constituents are removed from the wastewater matrix. The Agency believes that carbon adsorption is the most appropriate removal technology for the widest range of organic compounds likely to be present in the oxidation effluent stream.

Additionally, spent carbon from treating these wastewaters becomes a nonwastewater form of this waste (54 Federal Register 26630-1, June 23, 1989) and thus must be incinerated. EPA believes that incineration is the most successful method of treatment for a wide variety of organic wastes, and therefore is including carbon adsorption in the oxidation treatment train to ensure ultimate destruction of the regulated constituents present in the U and P wastewaters.

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Comment Number: 46-Div-1

Docket Number: LD12-00185

Commenter: Shell Oil Company

Issue: ISSUE CODE 46: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: Treatment Methods as Treatment Standards

Comment:

Treatment of Waste Associated Wastewaters In Conventional Wastewater Treatment Systems

The option to route dilute wastewaters from waste related activities to biotreatment in conventional wastewater systems should be allowed. Waters such as incinerator scrubber waters, contaminated groundwaters and multi-source leachate will likely be readily treatable to meet NPDES discharge limits set for those facilities. The process related constituents treated in the NPDES systems will be identical or similar to those found in the waste associated waters mentioned.

Attachment II expands on the discussion of this option and we encourage the Agency to consider this opportunity and reduce the administrative and regulatory burden associated with requiring the wastewater to carry the LDRs for the waste from which it was generated.

We recommend that the biodegradation potential at existing NPDES systems be made available for handling appropriate dilute wastewaters without the RCRA burdens being applied to those existing systems already handling the same or similar constituents.

Cont.

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Comment Number: 46 - Div - 1 (Continued)

Docket Number: LD12-00185

Commenter: Shell Oil Company

Issue: ISSUE CODE 46: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: Treatment Methods as Treatment Standards

Comment:

ATTACHMENT II

COMMENTS ON THE APPROPRIATENESS OF TREATING WASTEWATERS DERIVED FROM HALOGENATED HAZARDOUS WASTES IN CONVENTIONAL WASTEWATER TREATMENT SYSTEMS

In the proposed rules for land disposal restrictions of hazardous wastes, EPA not only proposes numerical standards for these solid wastes but also specifies treatment technologies for wastewaters derived from hazardous waste treatment units; i.e., scrubber water from incinerators and multi-source leachate. The proposed rule is specially stringent for wastewater containing halogenated organics; some of the designed U and P wastes. The Agency proposes three treatment technologies as alternative BDAT standards instead of numerical discharge limitations for various compounds. The technologies proposed are:

1. Wet Air Oxidation followed by Carbon Adsorption
2. Chemical Oxidation followed by Carbon Adsorption
3. Incineration of Wastewaters

Biodegradation has not been proposed, although it is not precluded from use as part of the treatment process. EPA is soliciting comments and data on this subject.

This attachment provide technical arguments on the inappropriateness of specifying generic treatment technology for specific wastewater without further waste characterization. Secondly, some biodegradation data on halogenated organics are provided to support the Shell position that using a conventional biotreater is the preferred disposal route for these wastewaters.

Treatment of Wastewater Containing Halogenated Organics

It is technically impossible to specify a generic treatment system for a wastewater stream without knowing its characteristics such as the types and concentration of the halogenated organics, the concentration of other organics and its inorganic salt contents. The current EPA approach presents a concern of leading to misapplication of technologies. This concern is demonstrated by commenting on limitations of the three treatment alternatives specified by EPA.

1. Wet Air Oxidation followed by Carbon Adsorption

   Wet air oxidation (WAO) is ordinarily used in treating concentrated organic wastes. In order to sustain self combustion, a wastewater COD concentration should be higher than 5,000 to 10,000 mg/l. For dilute waste, WAO is not applicable. Furthermore, the end products of WAO are short-chain carboxylic acids (mostly acetate), the followed activated carbon treatment specified by the EPA would not be

cont.

Comment Number: 46-Div-1 (Continued)

Docket Number: LD12-00185

Commenter: Shell Oil Company

Issue: ISSUE CODE 46: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: Treatment Methods as Treatment Standards

Comment:

effective for the removal of these acids. Additional biological treatment would be required prior to discharge.

Some of the chlorinated compounds, such a methyl chlorides and chloroform, are not effectively removed by carbon adsorption. We do not agree that this treatment sequence is a viable alternative for most wastewater containing halogenated organics.

2. Chemical Oxidation followed by Carbon Adsorption

Chemical oxidation, using ozone or hydrogen peroxide, alone is not effective for the reduction of most halogenated organics. UV light is also needed to generate the powerful free radicals from these oxidants. It is our experience that this technology becomes very expensive when the total organic concentration (not only halogenates) reaches above 10 ppm in the wastewater. Other inorganic salts such as carbonate ions are free radical scavengers. Their presence may render the chemical oxidation totally ineffective.

3. Incineration of Wastewaters

Incineration of dilute wastewater is a very energy inefficient and a costly operation. In addition, the salt resulting from the water evaporation presents corrosion and clogging problems. From our experience we do not believe this is a feasible alternative for dilute wastewater.

4. General Comments

Every wastewater treatment process has its own application niche. The selection of an appropriate treatment train should be tailored to specific conditions. One cannot accomplish the goal of pollution control by specifying a-prior generic treatment technologies for such a diversified class of wastewater as leachate streams from hazardous waste treatment operations. Thus we recommend that dilute wastewaters that are biodegradable are far more amenable to biotreatment than to any of the alternatives the Agency has proposed.

cont

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Comment Number: 46-Div-1 (Continued)

Docket Number: LD12-00185

Commenter: Shell Oil Company

Issue: ISSUE CODE 46: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: Treatment Methods as Treatment Standards

Comment:

Biodegradation Data for Halogenated Organics

Large number of halogenated organics are amenable to biotreatment. For some of them, biodegradation is the only alternative for their reduction. Significant amount of work has been done in the area of biodegradation of halogenated organics, either in the context of basic biological science and applied environmental control engineering. The following articles are summary papers in dealing with biotreatment of priority pollutants. They are but a very small portion of what is available in the open literature.

1. Peterson, J. W. and P. S. Kodukala, "Biodegradation of Hazardous Organic Pollutants", CEP, April, 1981, P. 49.
2. Richards, D. J. and W. K. Shieh, "Review Paper - Biological Fate of Organic Priority Pollutants in the Aquatic Environment", Water Research, Vol. 20, No. 9, 1986, P. 1077.
3. Lawson, C. T. and S. A. Stegriest, "Removal Mechanisms for Selected Priority Pollutants in Activated Sludge System", Proc. Environ. Engrg. Conf., American Society of Civil Engineering, Atlanta, Ga., 1981.
4. Tabak, H. H., S. A. Quave, C. I. Mashni and E. F. Barth, "Biodegradability Studies with Organic Priority Pollutant Compounds", Jour. of Water Pollution Control Federation Octo., 1981, P. 1503.

cont.

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Comment Number: 46-Div-1 (Continued)

Docket Number: LD12-00185

Commenter: Shell Oil Company

Issue: ISSUE CODE 46: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: Treatment Methods as Treatment Standards

Comment:

Treatment of These Derived Wastewaters in a Conventional NPDES Facility

For the petrochemical industries, most of the new hazardous waste treatment facilities will likely be located within production plants which are served by NPDES permitted wastewater treatment plants. The derived wastewaters are usually low contamination, low volume streams. In addition, these wastewater treatment systems are most likely designed to deal with the organics concerned.

To conserve resources and simplified treatment operations, whenever possible, combined treatment of these derived wastewater streams in a compatible NPDES facility should be encouraged and provided for in land disposal restrictions program without the burden of further permitting requirements under RCRA.

Comment Number: 46-Div-1

Docket Number: LD12 - 00185

Commenter: Shell Oil Company

Issue: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur, and Organo-Nitrogen Compound Wastes

Subissue: Treatment Methods as Treatment Standards

Response: The commenter recommends that the option to route dilute unquantifiable U and P wastewaters to biological treatment units in conventional wastewater systems should be allowed.

The Agency disagrees. Biological treatment is not being promulgated as a technology-based BDAT treatment standard for unquantifiable organic U and P wastewaters, because concentrations of these wastes in the influent to the biological treatment unit cannot be measured. Therefore, the treatment unit operators cannot control the levels of these wastes reaching the working organisms in the biological treatment unit. The risk of sending unmeasurable quantities of these wastes to a biological treatment unit includes the possibility of shock loads that would disable the plant's working organisms. This would allow these and other wastes to exit untreated in the effluent until the biological treatment system could be restored to working order.

The Agency believes that the best technologies for treating unquantifiable U and P wastewaters are those technologies that completely destroy the regulated constituents in U and P wastes, such as incineration, chemical oxidation, and wet air oxidation. As a result, the Agency does not consider carbon adsorption (used by itself), a removal technology, to be the best technology for treating unquantifiable U and P wastewaters.

This does not necessarily preclude carbon adsorption from being considered part of a BDAT treatment train. The Agency has determined that chemical oxidation and wet air oxidation provide substantial treatment of unquantifiable organic constituents in U and P wastewaters; however, since these constituents are unquantifiable, and therefore it is not possible to accurately judge the effectiveness of wet air oxidation and chemical oxidation, these destruction technologies alone may not completely treat the regulated organics in U and P wastes. EPA believes, therefore, that it is sound engineering judgment to include a final step of carbon adsorption following oxidation. This will ensure that remaining organic constituents are removed from the wastewater matrix. The Agency believes that carbon adsorption is the most appropriate removal technology for the widest range of organic compounds likely to be present in the oxidation effluent stream.

Additionally, spent carbon from treating these wastewaters becomes a nonwastewater form of this waste (54 Federal Register 26630-1, June 23, 1989) and thus must be incinerated. EPA believes that incineration is the most successful method of treatment for a wide variety of organic wastes, and therefore is including carbon adsorption in the oxidation treatment train to ensure ultimate destruction of the regulated constituents present in the U and P wastewaters.

Finally, the commenter should note that industrial wastewaters that are subject to the Clean Water Act and are hazardous under RCRA are subject to RCRA Subtitle C hazardous waste management regulations prior to discharge. (However, a wastewater treatment unit as defined in 40 CFR 260.10 need not be permitted.) The land disposal restrictions would only apply to such wastes if and when land disposal, as defined in 40 CFR 268.2, occurs. Absent placement in or on the land, the treatment standards would not apply.

Comment Number: 46-Ei-1

Docket Number: LD12-00099

Commenter: McGuire, Woods, Battle & Boothe (Solite)

Issue: ISSUE CODE 46: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: Thermal Treatment/Fuel Substitution

Comment:

Fuel Substitution as an Alternative Treatment Method

In general Solite agrees with the Agency's analysis of fuel substitution as an alternative treatment method at 54 F.R. 48407, cols. 2-3. However, Solite urges EPA to reconsider the placement of six specific "U" category wastes in the "Incineration as a Method of Treatment" category rather than in the "Incineration or Fuel Substitution as a Method of Treatment" category.

The additional compounds for which we believe fuel substitution should be allowed as an alternative method of treatment are:

U055 - Cumene
U056 - Cyclohexane
U186 - 1,3-pentadiene
U016 - Benz(c)acridine
U064 - 1,2,7,8-dibenzopyrene
U094 - 7,12-dimethyl benz(a)anthracene

All of the above listed wastes have significant energy value. We agree that they would not ordinarily be acceptable for fuel substitution due to their acid formation capability, but this is a concern only when they comprise all or a substantial part of the fuel being burned. When Solite encounters these compounds in a waste shipment they typically comprise only a small part of a mixture containing various ignitable wastes. Solite further blends the fuels that it receives, and so the percentage of any of these compounds in the fuel that is actually burned would always be very small, invariably well below ten percent. In these concentrations we believe that fuel substitution of these wastes has no adverse effects. With regard to the toxicity of these compounds, the safeguards that Solite and other facilities with storage permits have in place are at least equivalent to those of incinerators, as are the DREs achieved.

If fuel substitution of these wastes is not allowed, the result will be that mixtures containing only minor amounts of these wastes, which are perfectly suitable for fuel substitution, will have to be incinerated at much greater expense, and the energy value of the waste will be lost. Accordingly, we urge EPA to allow fuel substitution as BDAT for these specific wastestreams provided that they are mixed with other wastes for which fuel substitution is an alternative treatment method and comprise less than 10 percent of the resulting mixture.

Comment Number: 46-Ei-1

Docket Number: LD12 - 00099

Commenter: McGuire, Woods, Battle & Boothe (Solite)

Issue: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: Thermal Treatment/Fuel Substitution

Response:

The commenter suggests that fuel substitution be allowed as an alternative BDAT method of treatment for U055 (Cumene), U056 (Cyclohexane), U186 (1,3-Pentadiene), U016 (Benz(c)acridine), U064 (1,2,7,8-Dibenzopyrene), and U094 (7,12-Dimethyl benz(a)anthracene).

With the exception of U016, the Agency agrees with the commenter and is promulgating fuel substitution, along with incineration, as the BDAT treatment standard as a method of treatment for U055, U056, U186, U064, and U094. In general, the Agency is promulgating fuel substitution, along with incineration, as the BDAT treatment standard as a method of treatment for any unquantifiable U and P nonwastewater that contains only carbon, hydrogen, and/or oxygen in its chemical structure.

The Agency is basing this change in treatment options from the proposed rule on numerous comments received recommending the inclusion of fuel substitution in the final rule. Commenters noted that many organic U and P wastes have significant energy recovery value, which would be lost if incinerated. The Agency agrees to allow fuel substitution as a treatment method for wastes not amenable to quantification which contain only carbon, hydrogen, and/or oxygen, but not halogens, sulfur, or nitrogen, in their molecular structure. Eliminating halogen-, sulfur-, and nitrogen-containing wastes from use in a fuel substitution unit removes the potential for unregulated SOx, NOx, or halogens to be emitted from boilers or other thermal combustion facilities not yet regulated as treatment units under 40 CFR 264. Since U016 contains nitrogen, EPA does not consider fuel substitution to be an appropriate treatment method for it.

EPA believes that wastes without halogens, sulfur, or nitrogen can be treated by fuel substitution as well as by incineration because the aromatic and aliphatic (both saturated and unsaturated) components of these wastes are typically used as fuel due to their high heating value.

Comment Number: 46-Ei-2

Docket Number: LD12-00129

Commenter: Olin Chemicals

Issue: ISSUE CODE 46: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: Thermal Treatment/Fuel Substitution

Comment:

Olin believes that the Agency has further erred in the determination of the value and treatability of these wastes. Some of these wastes have extremely high heating values (in excess of 15,000 BTU/lb), and to eliminate these wastes from a useful purpose - energy recovery - is contradictory to waste minimization. The Agency's reasoning for not allowing fuel substitution for these wastes is "..their relative high toxicity and acid formation capability..." The USEPA currently has a proposal that limits the emissions and restricts the wastes that can be burned as fuel substitution (Burning of Hazardous Waste in Boilers and Industrial Furnaces, 54 FR 206, pg. 43718, October 26, 1989). This regulation will be in addition to the existing air regulations which also limit the allowable fuels and emissions from these facilities. In addition to the air regulations, most fuel substitution facilities have RCRA permits which limit the quantities and types of waste that are acceptable. State toxic air regulations presently in effect in some states, proposed in other states, and the proposed Clean Air Act Amendments containing an air toxics program will adequately regulate these emissions.

For the above reasons, Olin requests that USEPA redesignate the wastes in this subcategory where BDAT is a specified technology as "Incineration or Fuel Substitution."

Comment Number: 46-Ei-2

Docket Number: LD12 - 00129

Commenter: Olin Chemicals

Issue: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: Thermal Treatment/Fuel Substitution

Response:

The commenter suggests that fuel substitution be allowed as an alternative BDAT method of treatment for nonhalogenated polynuclear aromatic U and P wastes.

The Agency agrees with the commenter and is promulgating fuel substitution, along with incineration, as the BDAT treatment standard as a method of treatment for certain unquantifiable U and P nonwastewaters. In general, the Agency is promulgating fuel substitution, along with incineration, as the BDAT treatment standard as a method of treatment for any unquantifiable U and P nonwastewater that contains only carbon, hydrogen, and/or oxygen in its chemical structure.

The Agency is basing this change in treatment options from the proposed rule on numerous comments received recommending the inclusion of fuel substitution in the final rule. Commenters noted that many organic U and P wastes have significant energy recovery value, which would be lost if incinerated. The Agency agrees to allow fuel substitution as a treatment method for wastes not amenable to quantification which contain only carbon, hydrogen, and/or oxygen, but not halogens, sulfur, or nitrogen, in their molecular structure. Eliminating halogen-, sulfur-, and nitrogen-containing wastes from use in a fuel substitution unit removes the potential for unregulated SOx, NOx, or halogens to be emitted from boilers or other thermal combustion facilities that are not yet regulated as treatment units under 40 CFR 264.

EPA believes that wastes without halogens, sulfur, or nitrogen can be treated by fuel substitution as well as by incineration because the aromatic and aliphatic (both saturated and unsaturated) components of these wastes are typically used as fuel due to their high heating value.

Comment Number: 46-Ei-3

Docket Number: LD12-00138

Commenter: Oxychem

Issue: ISSUE CODE 46: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: Thermal Treatment / Fuel Substitution

Comment:

EPA SHOULD MODIFY THE PROPOSED BDAT STANDARDS

EPA Has Unnecessarily Excluded Fuel Substitution as an Alternative for Most "U" and "P" Wastes.

EPA has expressed a concern that a large number of "U" and "P" wastes, e.g., halogenated wastes and nonhalogenated wastes, if burned as fuel substitutes, would produce acid gases and result in the emission of toxic constituents. In addition, for the halogenated "U" and "P" wastes, the Agency expresses the opinion that these wastes have low fuel content. OxyChem believes that existing regulations under the Clean Air Act are sufficient to address these concerns.

Air permits can require acid gas emission controls. For purposes of corrosion control, boiler operators limit the chloride content of all fuel substitutes. Although by themselves some halogenated wastes have low fuel content, high fuel content materials may be identified with these waste codes as a result of the mixture and/or derived-from rules. The material may be amenable for use as a fuel substitute but under the proposed rules would have to be incinerated.

Fuel substitution is a valuable means of managing hazardous wastes. Combustion, whether carried out in a boiler, incinerator, or wet-air oxidation unit will destroy the hazardous constituents. EPA's concerns about acid gas emissions can be addressed by existing regulations and by common sense operating practices. Accordingly, OxyChem believes EPA should allow fuel substitution as an alternative for "U" and "P" wastes.

Comment Number: 46-Ei-3

Docket Number: LD12 - 00138

Commenter: Oxychem

Issue: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: Thermal Treatment/Fuel Substitution

Response:

The commenter suggests that fuel substitution be allowed as an alternative BDAT method of treatment for U and P wastes.

The Agency agrees with the commenter and is promulgating fuel substitution, along with incineration, as the BDAT treatment standard as a method of treatment for certain unquantifiable U and P nonwastewaters. In general, the Agency is promulgating fuel substitution as a BDAT treatment standard for any unquantifiable U and P nonwastewater that contains only carbon, hydrogen, and/or oxygen in its chemical structure.

The Agency is basing this change in treatment options from the proposed rule on numerous comments received recommending the inclusion of fuel substitution in the final rule. Commenters noted that many organic U and P wastes have significant energy recovery value, which would be lost if incinerated. The Agency agrees to allow fuel substitution as a treatment method for wastes not amenable to quantification which contain only carbon, hydrogen, and/or oxygen, but not halogens, sulfur, or nitrogen, in their molecular structure. Eliminating halogen-, sulfur-, and nitrogen-containing wastes from use in a fuel substitution unit removes the potential for unregulated SOx, NOx, or halogens to be emitted from boilers or other thermal combustion facilities not yet regulated as treatment units under 40 CFR 264.

EPA believes that wastes without halogens, sulfur, or nitrogen can be treated by fuel substitution as well as by incineration because the aromatic and aliphatic (both saturated and unsaturated) components of these wastes are typically used as fuel due to their high heating value.

Comment Number: 46-Ei-4

Docket Number: LD12-00168

Commenter: American Petroleum Institute

Issue: ISSUE CODE 46: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: Thermal Treatment/Fuel Substitution

Comment:

III. A.2.a.(2) - Proposed Treatment Standards for Halogenated Organic Wastes; Specifying Incineration for Halogenated Nonwastewaters

EPA notes that where it is imposing incineration as a method of treatment for halogenated organic wastes it is not including "fuel substitution" as an alternative. If the standard is concentration based, however, then thermal destruction in a fuel substitution unit is allowed. 54 Fed. Reg. 48393.

API suggests that the standard for treating halogenated organic wastes should be revised to allow fuel substitution. These wastes have fuel value, and there is no environmental reason not to make use of it.

Comment Number: 46-Ei-4

Docket Number: LD12 - 00168

Commenter: American Petroleum Institute

Issue: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: Thermal Treatment/Fuel Substitution

Response:

The commenter suggests that fuel substitution be allowed as an alternative BDAT method of treatment for halogenated U and P wastes.

The Agency is promulgating fuel substitution, along with incineration, as the BDAT treatment standard as a method of treatment for certain unquantifiable U and P nonwastewaters, but not for halogenated U and P nonwastewaters. In general, the Agency is promulgating fuel substitution as a BDAT treatment standard for any unquantifiable U and P nonwastewater that contains only carbon, hydrogen, and/or oxygen in its chemical structure.

The Agency is basing this change in treatment options from the proposed rule on numerous comments received recommending the inclusion of fuel substitution in the final rule. Commenters noted that many organic U and P wastes have significant energy recovery value, which would be lost if incinerated. The Agency agrees to allow fuel substitution as a treatment method for wastes not amenable to quantification which contain only carbon, hydrogen, and/or oxygen, but not halogens, sulfur, or nitrogen, in their molecular structure. Eliminating halogen-, sulfur-, and nitrogen-containing wastes from use in fuel substitution units removes the potential for unregulated SOx, NOx, or halogens to be emitted from boilers or other thermal combustion facilities not yet regulated as treatment units under 40 CFR 264.

EPA believes that wastes without halogens, sulfur, or nitrogen can be treated by fuel substitution as well as by incineration because the aromatic and aliphatic (both saturated and unsaturated) components of these wastes are typically used as fuel due to their high heating value.

Comment Number: 46-Ei-5

Docket Number: LD12-00190

Commenter: Union Carbide

Issue: ISSUE CODE 46: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: Thermal Treatment/Fuel Substitution

Comment:

Fuel Substitution Should be an Allowable Treatment Technology for Halogenated Organic Wastes - UCC believes that the Agency should allow fuel substitution as an acceptable treatment alternative for halogenated organic wastes. Chloride emissions from these streams will be controlled by the recently proposed rule for burning hazardous wastes in boilers and industrial furnaces. Many of these streams have an excellent fuel value and, with the boiler rules, the burning of these wastes will be done in a manner that is protective of human health and the environment. Also, elimination of this technology as an acceptable method will again add a significant burden to an already scarce commodity-incineration capacity.

Comment Number: 46-Ei-5

Docket Number: LD12 - 00190

Commenter: Union Carbide

Issue: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: Thermal Treatment/Fuel Substitution

Response:

The commenter suggests that fuel substitution be allowed as an alternative BDAT method of treatment for halogenated U and P wastes.

The Agency is promulgating fuel substitution, along with incineration, as the BDAT treatment standard as a method of treatment for certain unquantifiable U and P nonwastewaters, but not for halogenated U and P nonwastewaters. In general, the Agency is promulgating fuel substitution as a BDAT treatment standard for any unquantifiable U and P nonwastewater that contains only carbon, hydrogen, and/or oxygen in its chemical structure.

The Agency is basing this change in treatment options from the proposed rule on numerous comments received recommending the inclusion of fuel substitution in the final rule. Commenters noted that many organic U and P wastes have significant energy recovery value, which would be lost if incinerated. The Agency agrees to allow fuel substitution as a treatment method for wastes not amenable to quantification which contain only carbon, hydrogen, and/or oxygen, but not halogens, sulfur, or nitrogen, in their molecular structure. Eliminating halogen-, sulfur-, and nitrogen-containing wastes from use in a fuel substitution unit removes the potential for unregulated SOx, NOx, or halogen to be emitted from boilers or other thermal combustion facilities not yet regulated as treatment units under 40 CFR 264. EPA notes, however, that boiler regulations are under development.

EPA believes that wastes without halogens, sulfur, or nitrogen can be treated by fuel substitution as well as by incineration because the aromatic and aliphatic (both saturated and unsaturated) components of these wastes are typically used as fuel due to their high heating value.

Comment Number: 46 - Ei - 6

Docket Number: LD12 - 00242

Commenter: Merck & Co. Inc.

Issue: ISSUE CODE 46: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: Thermal Treatment / Fuel Substitution

Comment:

Another area of concern for Merck is the availability of fuels blending number of compounds with treatment standards of incineration or fuels substitution specified is limited. There are several compounds, U055-Cumene, U056-Cyclohexane, and U186-1,3-Pentadiene which only have incineration specified without opportunity for fuels blending. Because these hazardous wastes were listed for ignitability EPA's concern about toxicity and acid gas formation from burning as fuels would not apply. Furthermore, some of these compounds are degradation products from other compounds that are known to more toxic (e.g., benzene, toluene, and xylene) and have numerical treatment standards based on incineration and which are eligible for fuels blending, It should also be noted that boilers and industrial furnaces typically have higher operating temperatures and therefore better destruction than incinerators. We would suggest that at a minimum the treatment standard for U055, U056 and U186 have a treatment standard of incineration or fuels substitution and would further suggest that all U-listed compounds which are listed for ignitability only and the standard is expressed as a method of treatment, have treatment standards of incineration or fuels substitution.

We also feel that the Agency is being overly restrictive in specifying incineration only for halogenated non-wastewaters. We feel that BDAT for HOCs should be incineration or fuels substitution. We can understand the Agency's concern about the toxicity of the pesticides and other halogenated organics listed for toxicity however we feel that the need for control of HCl emissions from the destruction of halogenated organics not listed for toxicity is not a valid argument. Currently, boilers and industrial furnaces have an emission rate limitation or a required control efficiency in their permits to receive the hazardous waste fuels. Furthermore, these limits are usually set by local air agencies taking into account acid gas formation. There is no reason to preclude feed of halogenated compounds within this limitation.

The supplemental notice to the proposed rule for boilers and industrial furnaces is proposing an approach for control of acid gases similar to that being used under the Omnibus authority for RCRA hazardous waste incinerators. This limitation established feed rate and emission rate limitations from health risk-based levels. We feel that the existing limitations are sufficiently protective of public health and the environment for control of acid gases and when the new regulations are promulgated in late 1990 they will be even more protective. Therefore, we feel that the Agency should allow fuels substitution for those halogenated non-wastewaters that are not listed for toxicity.

Comment Number: 46-Ei-6

Docket Number: LD12 - 00242

Commenter: Merck & Co. Inc.

Issue: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: Thermal Treatment/Fuel Substitution

Response:

The commenter suggests that fuel substitution be allowed as an alternative BDAT method of treatment for U and P wastes, specifically U055 (Cumene), U056 (Cyclohexane), and U186 (1,3-Pentadiene), along with halogenated U and P nonwastewaters.

The Agency agrees and is promulgating fuel substitution, along with incineration, as the BDAT treatment standard as a method of treatment for certain unquantifiable U and P nonwastewaters, including U055, U056, and U186, but not for halogenated U and P nonwastewaters. In general, the Agency is promulgating fuel substitution as a BDAT treatment standard for any unquantifiable U and P nonwastewater that contains only carbon, hydrogen, and/or oxygen in its chemical structure.

The Agency is basing this change in treatment options from the proposed rule on numerous comments received recommending the inclusion of fuel substitution in the final rule. Commenters noted that many organic U and P wastes have significant energy recovery value, which would be lost if incinerated. The Agency agrees to allow fuel substitution as a treatment method for wastes not amenable to quantification which contain only carbon, hydrogen, and/or oxygen, but not halogens, sulfur, or nitrogen, in their molecular structure. Eliminating halogen-, sulfur-, and nitrogen-containing wastes from use in a fuel substitution unit removes the potential for unregulated SOx, NOx, or halogens to be emitted from boilers or other thermal combustion facilities not yet regulated as treatment units under 40 CFR 264.

EPA believes that wastes without halogens, sulfur, or nitrogen can be treated by fuel substitution as well as by incineration because the aromatic and aliphatic (both saturated and unsaturated) components of these wastes are typically used as fuel due to their high heating value.

Comment Number: 46-Ei-7

Docket Number: LD12-00128

Commenter: Vulcan Chemicals

Issue: ISSUE CODE 46: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: Thermal Treatment / Fuel Substitution

Comment:

Proposed Treatment Standards for Halogenated Organic Wastes

Since many of the chemicals which are U and P listed wastes also fall within the general category of halogenated hydrocarbons, EPA is proposing to establish treatment standards for these halogenated chemicals by establishing six general categories of halogenated organics and to establish concentration-based treatment standards for each general category. Wastes containing more than 1000 ppm of the halogenated U and P chemicals would also qualify as California List HOC's and the BDAT for these HOC's is Incineration as a Method of Treatment, with Fuel Substitution as an alternative Method of Treatment. However, due to the potentially large quantity of off-specification or spilled U and P chemicals or the potentially high toxicity of some of the U and P chemicals, EPA is proposing that Incineration as a Method of Treatment also apply to the U and P halogenated organic chemicals but the alternative of fuel substitution not be allowed unless there is a concentration-based treatment standard for that particular chemical. Then, destruction in fuel substitution units would not be precluded.

Comment Number: 46-Ei-7

Docket Number: LD12 - 00128

Commenter: Vulcan Chemicals

Issue: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: Thermal Treatment/Fuel Substitution

Response:

The commenter points out that fuel substitution is not allowed as an alternative BDAT method of treatment for halogenated U and P nonwastewaters, under the proposed rule.

The Agency is promulgating fuel substitution, along with incineration, as the BDAT treatment standard as a method of treatment for certain unquantifiable U and P nonwastewaters, but not for halogenated U and P nonwastewaters. In general, the Agency is promulgating fuel substitution as a BDAT treatment standard for any unquantifiable U and P nonwastewater that contains only carbon, hydrogen, and/or oxygen in its chemical structure.

The Agency is basing this change in treatment options from the proposed rule on numerous comments received recommending the inclusion of fuel substitution in the final rule. Commenters noted that many organic U and P wastes have significant energy recovery value, which would be lost if incinerated. The Agency agrees to allow fuel substitution as a treatment method for wastes not amenable to quantification which contain only carbon, hydrogen, and/or oxygen, but not halogens, sulfur, or nitrogen, in their molecular structure. Eliminating halogen-, sulfur-, and nitrogen-containing wastes from use in a fuel substitution unit removes the potential for unregulated SOx, NOx, or halogens to be emitted from boilers or other thermal combustion facilities not yet regulated as treatment units under 40 CFR 264.

EPA believes that wastes without halogens, sulfur, or nitrogen can be treated by fuel substitution as well as by incineration because the aromatic and aliphatic (both saturated and unsaturated) components of these wastes are typically used as fuel due to their high heating value.

Comment Number: 46-Ei-8

Docket Number: LD12-L0007

Commenter: Chemical Manufacturers Association

Issue: ISSUE CODE 46: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: Thermal Treatment/Fuel Substitution

Comment:

F. EPA Has Unnecessarily Excluded Fuel Substitution as an Alternative for Most "U" and "P" Wastes.

EPA has expressed a concern that a large number of "U" and "P" wastes, e.g., halogenated wastes (54 Fed. Reg. at 48,392) and nonhalogenated wastes (id. at 48,407), if burned as fuel substitutes, will generate acid gases and result in toxic constituent emissions. In addition, the Agency is concerned that halogenated "U" and "P" wastes have low fuel content. CMA believes that these concerns are overstated. Not only are there existing regulations in the Clean Air Act which may address these emissions, but owner/operators limit the chlorine content of all fuel substitutes in accordance with good operating practices. In addition, CMA notes that EPA has already proposed relevant emission limits for burning hazardous waste in boilers and industrial furnaces.

Fuel substitution is a valuable method of managing hazardous waste. EPA's own data show that boilers and industrial furnaces burning hazardous waste routinely achieve 99.95 percent destruction/removal efficiencies. This management technique helps conserve fossil fuels. Therefore, EPA should not hesitate to adopt fuel substitution as BDAT for appropriate "P" and "U."

Comment Number: 46-Ei-8

Docket Number: LD12 - L0007

Commenter: Chemical Manufacturers Association

Issue: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: Thermal Treatment/Fuel Substitution

Response:

The commenter suggests that fuel substitution be allowed as an alternative BDAT method of treatment for U and P wastes.

The Agency agrees with the commenter and is promulgating fuel substitution, along with incineration, as the BDAT treatment standard as a method of treatment for certain unquantifiable U and P nonwastewaters. In general, the Agency is promulgating fuel substitution, along with incineration, as the BDAT treatment standard as a method of treatment for any unquantifiable U and P nonwastewater that contains only carbon, hydrogen, and/or oxygen in its chemical structure.

The Agency is basing this change in treatment options from the proposed rule on numerous comments received recommending the inclusion of fuel substitution in the final rule. Commenters noted that many organic U and P wastes have significant energy recovery value, which would be lost if incinerated. The Agency agrees to allow fuel substitution as a treatment method for wastes not amenable to quantification which contain only carbon, hydrogen, and/or oxygen, but not halogens, sulfur, or nitrogen, in their molecular structure. Eliminating halogen-, sulfur-, and nitrogen-containing wastes from use in a fuel substitution unit removes the potential for unregulated SOx, NOx, or halogens to be emitted from boilers or other thermal combustion facilities not yet regulated as treatment units under 40 CFR 264.

EPA believes that wastes without halogens, sulfur, or nitrogen can be treated by fuel substitution as well as by incineration because the aromatic and aliphatic (both saturated and unsaturated) components of these wastes are typically used as fuel due to their high heating value.

Comment Number: 46-Eii-1

Docket Number: LD12-00149

Commenter: CEMENT KILN RECYCLING COALITION

Issue: ISSUE CODE 46: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: Thermal Treatment / Fuel Substitution

Comment:

B. Incineration as a Method of Treatment for Non-Wastewaters

Our comments in this subsection apply to the following technology-based standards proposed for non-wastewaters:

1. Incineration as a method of treatment for non-wastewater forms of: K025, P002, P007, P008, P014, P016, P017, P018, P022, P023, P026, P027, P028, P034, P042, P045, P046, P047, P049, P054, P057, P058, P064, P066, P067, P069, P070, P072, P075, P084, P093, P095, P108, P116, P118, U006, U007, U010, U011, U014, U015, U016, U017, U020, U021, U026, U033, U034, U035, U041, U042, U046, U049, U055, U056, U059, U062, U064, U089, U090, U091, U092, U094, U095, U097, U110, U114, U116, U119, U143, U148, U149, U150, U153, U156, U163, U164, U171, U173, U176, U177, U178, U186, U191, U193, U194, U200, U202, U206, U218, U219, U222, U234, U236, U237, U238, U240 and U244.

The principal chemical oxides required for the production of cement are calcia (typically provided by limestone), silica and alumina (usually provided by appropriate mixtures of clay, shale, slate and sand) and iron (usually supplemented by iron ore or steel mill scale when an insufficient amount is present in natural raw materials).

cont.

2/3

Comment Number: 46-Eii - 1

Docket Number: LD12-00149

Commenter: CEMENT KILN RECYCLING COALITION (continued)

Issue: ISSUE CODE 46: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: Thermal Treatment/Fuel Substitution

Comment:

The Cement Kiln Recycling Coalition recommends that recycling in cement kilns be specified as one of the treatment methods for these wastes. This recommendation is based on the same seven reasons specifically mentioned in item A above.

1. It will provide a technology for these wastes which is superior to other technologies specified.
2. It will not result in any residues generated in the treatment process.
3. It is a safer technology than some of the multiple treatments specified for the protection of the environment and public health by preventing multiple handling of wastes.
4. It provides more favorable conditions for the destruction of hazardous constituents than the incineration method through higher temperatures and residence times.
5. The product (i.e., cement) is not a saleable product if it does not meet ASTM standards. Hence, the introduction of hazardous wastewaters in cement kilns will be very carefully monitored and controlled.
6. Any hydrocarbon emissions will be specifically controlled by the upcoming Boiler and Industrial Furnace regulations (PIC standard).

cont.

3/3

Comment Number: 46-Eii-1

Docket Number: LD12-00149

Commenter: CEMENT KILN RECYCLING COALITION (continued)

Issue: ISSUE CODE 46: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue:

Comment: Thermal Treatment / Fuel Substitution

7. This recycling technology will enhance EPA's objectives of waste minimization and recycling.

Comment Number: 46-Eii-1

Docket Number: LD12 - 00149

Commenter: Cement Kiln Recycling Coalition

Issue: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: Thermal Treatment/Fuel Substitution

Response:

The commenter recommends that recycling in cement kilns be specified as one of the BDAT treatment standards for various nonanalyzable U and P nonwastewaters, in addition to incineration.

EPA develops BDAT treatment standards based on technologies that are proven to be effective in treating the waste(s) of interest. BDAT is determined for a particular waste by applying the following methodology:

(1) The Agency first determines which technologies are potentially applicable for treatment of the waste(s) of interest. To be applicable, a technology must theoretically be usable to treat the waste(s) in question or a waste that is similar in terms of parameters that affect treatment selection.

(2) The Agency then determines which of the applicable technologies are demonstrated for treatment of the waste(s) of interest. To be demonstrated, a technology must be employed in full-scale operation for treatment of the waste in question or a similar waste. Technologies available only at pilot- or bench-scale operations are not considered in identifying demonstrated technologies.

(3) The next step is to determine which of the demonstrated technologies is "best" for the purposes of establishing BDAT. Best demonstrated technology is determined based on a thorough review of all the treatment data available on the waste of concern or wastes judged to be similar.

(4) Finally, the Agency determines whether the best demonstrated technology is "available" for treatment of the waste(s) of interest. An available treatment technology is one that (a) is not a proprietary or patented process that cannot be purchased or licensed from the proprietor (ie. it must be commercially available), and (b) substantially diminishes the toxicity of the waste or substantially reduces the likelihood of migration of hazardous constituents from the waste.

Where standards are concentration-based, fuel substitution can be used to achieve the BDAT levels. Where methods are specified, EPA has included fuel substitution for particularly fuel-worthy compounds, at least until the Boiler and Furnace rules are promulgated.

Comment Number: 46-Eiii-1

Docket Number: LD12-00179

Commenter: THE DOW CHEMICAL COMPANY

Issue: ISSUE CODE 46: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: Thermal Treatment/Fuel Substitution

Comment:

XXII. EPA SHOULD RECOGNIZE TREATMENT TECHNOLOGIES OTHER THAN INCINERATION FOR TREATMENT OF U055 WASTES AND OTHER ORGANIC P & U-LISTED WASTES

54 Fed. Reg. 48,409, Column 3

In general, we would agree with EPA's determination that incineration is the appropriate treatment technology for U055 (cumene) and other such organic P & U-listed wastes. However, as more and more corrective action operations are begun, this determination may present a severe problem. Clean-up of spill residues could easily overload incineration capacity at a facility. Yet, the current proposal might leave no alternative. Some of the in situ types of treatment which the Agency itself is pursuing could be completely disallowed by such a treatment standard. EPA should consider the future ramifications of such a technology standard given the continually increasing emphasis on corrective action.

Comment Number: 46-Eiii-1

Docket Number: LD12 - 00179

Commenter: The Dow Chemical Company

Issue: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: Thermal Treatment/Fuel Substitution

Response:

The commenter points out that specifying incineration as BDAT for U055 (cumene) and other organic U and P nonwastewaters may pose a severe problem to corrective action operations, specifically to clean-ups of spill residues. In fact, some of the in-situ types of treatment which the Agency itself is pursuing could be completely disallowed by such a treatment standard.

First, the Agency is promulgating both incineration and fuel substitution as BDAT treatment standards for U055 and other nonanalyzable organic U and P nonwastewaters that have only carbon, hydrogen, and/or oxygen in their chemical structure. Fuel substitution has not been established as a method of treatment for nonanalyzable organic U and P nonwastewaters that contain bromine, nitrogen, sulfur, and/or halogenated atoms.

Second, the Agency is promulgating incineration and, where applicable, fuel substitution as the BDAT treatment standards because these technologies were determined to be the best technologies available for treating these wastes. EPA's determination of BDAT technologies takes into account both the ability of the technologies to treat the waste and the availability of the technology. The fact that other technologies currently being used may no longer be used to treat and dispose of these wastes is not a factor considered in EPA's development of BDAT treatment standards. In addition, EPA is trying to develop separate treatment standards for contaminated soil and debris. In the interim, affected facilities may apply for site-specific treatability variances, as discussed in 40 CFR 268.44 (see the preamble to the National Contingency Plan).

Third, some in-situ treatment of spills may not be subject to the land disposal restrictions, and thus treatment standards, because no hazardous waste is being physically excavated from the site. Therefore, no hazardous waste generation is occurring.

Comment Number: 46-Fi-1

Docket Number: LD12-00164

Commenter: INSTITUTE OF CHEMICAL WASTE MANAGEMENT

Issue: ISSUE CODE 46: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: PQL/Analytical Issues

Comment:

Practical Quantitation Limits (PQL)

The Agency defines PQLs as the "lowest level of quantitation that a competent laboratory can be expected to achieve reliably". The presence of some organic constituents in treatment residue can result in PQLs being greater than the LDR treatment concentrations and other regulatory threshold levels. Because of a belief that destructive technologies will reduce matrix interferences, which make reaching PQLs difficult, the Agency appears unconcerned by this situation. The Agency indicates that treatment variances can be sought for those wastes with continuing analytical problems.

The members of the Institute recently submitted a letter to the Agency's Office of Solid Waste, Methods Section addressing similar analytical problems. Included in the letter were actual data that verified those situations where waste streams such as landfill leachate and gas condensates had interference difficulties. In addition, some ICWM members have experienced these analytical interferences when verifying treatment levels in incinerator ash, suggesting that the Agency belief about destructive technology may not be correct.

Thus, the ICWM is concerned that the verification of regulatory threshold concentrations (i.e, concentration-based BDAT and TCLP), which are lower than PQLs, is not analytically possible on a routine basis. If the Agency goes forward with its proposed approach, the outcome will likely be substantial numbers of treatability variances being requested by the regulated community, an undesirable situation for all concerned.

Resolving this problem is possible without extensive re-evaluation of BDAT levels or other regulatory threshold concentrations. The Institute recommends that the Agency mandate quality control/quality assurance (QA/QC) criteria and processes within the final regulations. Precision and accuracy requirements would be identified for each of those standards that fall below the PQL. Using Agency established QA/QC criteria, each laboratory could establish appropriate quantitation limits for each unique sample matrix and report these to EPA and state officials. Only in those rare instances where matrix interference could not be appropriately corrected would it be necessary to seek treatability variances. The ICWM believes that such a requirement would reduce the number of petitions for treatability variances.

Comment Number: 46-Fi-1

Docket Number: LD12 - 00164

Commenter: Institute of Chemical Waste Management

Issue: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: PQL/Analytical Issues

Response:

See response 1-D-1.

Comment Number: 46-Fi-2

Docket Number: LD12-00188

Commenter: ENVIRONMENTAL SYSTEMS COMPANY

Issue: ISSUE CODE 46: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: PQL/Analytical Issues

Comment:

D) LACK OF EFFECTIVE ANALYTICAL METHODS TO DEMONSTRATE COMPLIANCE WITH CERTAIN BDAT STANDARDS

ENSCO is one of the six firms that participated in the recently completed "Interlaboratory Study" (submitted December 22, 1989) assessing the "method detection limits" and "practical quantitation limits" for incineration ash matrices. The study, which was conducted in cooperation with the EPA Methods Branch, assessed the ability of EPA-approved SW-846 analytical methods to measure compliance with BDAT standards.

At least insofar as incineration ash is concerned, the study indicated that the "practical quantitation level" was often higher than the BDAT treatment standard. This finding poses obvious BDAT compliance and certification problems, since it means that even well-run laboratories using EPA-approved analytical procedures cannot reliably measure down to BDAT standards when measuring certain constituents in incineration ash.

As indicated in the study, we believe that this situation results from physical factors affecting incineration ash --- including the absorptive effects of activated carbon and silicates and the large active surface areas of the ash. Since EPA has not yet established PQL's for waste matrices, we believe that these factors have not previously been taken into account.

We would like to emphasize that while high-temperature incineration may actually reduce these constituents to levels well below the BDAT level, it is not possible using currently approved analytical techniques to consistently prove that this is true. (By the same token, it is impossible to reliably prove that BDAT levels have been exceeded).

Given the significance of these findings and the major investment of time and money in this study by both the participating companies and by EPA, we urge the Agency make appropriate adjustments to the final "Third Thirds" rule.

Comment Number: 46-Fi-2

Docket Number: LD12 - 00188

Commenter: Environmental Systems Company

Issue: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: PQL/Analytical Issues

Response:

See response 1-D-16.

Comment Number: 46-Fi-3

Docket Number: LD12-00159

Commenter: Waste Management, Inc. and Chemical Waste Management, Inc.

Issue:

Subissue: ISSUE CODE 46: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Response: PQL/Analytical Issues

2. Achievability of PQLs and BDAT

EPA has also quoted SW-846's recognition that "[s]ample PQLs are highly matrix-dependent. The PQLs listed herein are provided for guidance and may not always be achievable." 54 Fed. Reg. at 48,385, quoting SW-846, September 1986, Table 2, pp. 8250-5. From this point, it follows that:

(1) when the BDAT criteria are below or near the PQL, the BDAT level will not be achievable; and

(2) the monitoring of achievement of treatment standards can be done only when the BDAT is above the PQL.

It is apparent that the EPA has not followed the quoted principle to these logical conclusions when evaluating BDAT. Review of the Third-Third standards reveals that nearly 35% of these BDATs are below SW-846 GC/MS PQLs for all matrices measured. Moreover, 9% of the BDATs were set on compounds for which there are no SW-846 GC/MS methods for identification, quantification or verification.

Comment Number: 46-Fi-3

Docket Number: LD12 - 00159

Commenter: Waste Management, Inc. and Chemical Waste Management, Inc.

Issue: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: PQL/Analytical Issues

Response:

See response 1-D-5.

1/2

Comment Number: 46-Fi-4

Docket Number: LD12-00151

Commenter: GULF COAST WASTE DISPOSAL AUTHORITY

Issue: ISSUE CODE 46: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: PQL/Analytical Issues

Comment:

III.A.1.e.
Analytical Requirements and Relationship of PQLs to BDAT

The Agency states that a variance from a treatment standard may be obtained, if it is shown that the waste matrix interferes with the applicable SW-846 analytical method so that compliance cannot be demonstrated.

The Agency does not prescribe a procedure for obtaining a variance for obtaining relief from a standard for which compliance cannot be measured with available analytical methods. To avoid administrative problems in obtaining what should be a straight-forward variance, EPA should specify the procedures that must be followed to obtain a treatability variance for analytical inability to measure at the prescribed level.

In section III.A.1.e.(3) of the proposed rule, the Agency describes the relationship between the practical quantitation limits (PQLs) published in *Test Methods for Evaluating Solid Wastes*, (SW-846), September 1986, and the BDAT standards, especially those that are based on detection limits. EPA states that when a facility believes that waste-specific treatment standards cannot be met because their laboratory is unable to achieve PQLs below the treatment standards on a specific waste residual, the facility may submit a petition for a variance from the treatment standards for that particular waste code. GCA supports this position, however, there is no specified procedure in SW-846 for determining a PQL. Furthermore, because the treatment standards are based on method detection limits (MDLs), not PQLs, the procedures used to estimate these limits do not consider either the quantification of the constituent of interest nor the interlaboratory component of analytical uncertainty.

In order to have the petition for variance for adjustment of a BDAT standard reflect analytical capabilities for a specific waste, EPA must provide a more explicit definition of the protocols that should be used to define the MDL or PQL for a specific waste matrix. The first step should be to define whether or not the standard should be based on detection (an MDL) or quantification (a PQL).

2/2

Comment Number: 46 - Fi - 4 (Continued)

Docket Number: LD12-00151

Commenter: GULF COAST WASTE DISPOSAL AUTHORITY (continued)

Issue: ISSUE CODE 46: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: PQL/Analytical Issues

Comment:

The problem of demonstrating compliance with treatment standards that are based on detectable levels of hazardous constituents is great for characteristic wastes and P and U wastes, which may exhibit a very wide range of matrices. They may consist of soil matrices, sludge matrices, or wastewaters. Although the Agency argues, with some merit, that for those nonwastewaters that have standards based on incineration the problems of matrix interference should be reduced, they are not eliminated. It is probable that some waste treaters, especially those that are treating characteristic, P, and U wastes, and multi-source leachate, may not be able to achieve those BDAT standards that are based on detection limits.

Since this result will require such treaters to apply for waste-specific standards, EPA should specify the procedure that is to be used to establish the waste/treatment-specific detection or quantitation limits. GCA recommends the following approach.

Since it is impractical for most waste treaters to develop an interlaboratory PQL, a quantitation level based on a single-laboratory study by the laboratory that is responsible for demonstrating continued compliance with the standard for the waste in question should be acceptable. GCA believes that the protocol provided in SW-846 for estimating the MDL should be used to establish the detection (not quantitation) limit for the treated waste matrix. This procedure is an accepted and proven basis for estimating the ability to detect the presence of a chemical in a waste at a 99 percent confidence level. The MDL measured for a specific waste can then be converted to a quantification limit (PQL) by multiplying it by 10. This is the the procedure that the Agency has typically used to establish PQLs.

Comment Number: 46-Fi-4

Docket Number: LD12 - 00151

Commenter: Gulf Coast Waste Disposal Authority

Issue: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: PQL/Analytical Issues

Response:

See response 1-D-4.

Comment Number: 46-Fi -5

Docket Number: LD12-00179

Commenter: THE DOW CHEMICAL COMPANY

Issue: ISSUE CODE 46: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue.

Comment: PQL/Analytical Issues

IV. RELATIONSHIP OF TREATMENT STANDARDS TO PRACTICAL QUANTIFICATION LIMITS (PQLs).

54 Fed. Reg. 48,385 column 2

EPA has recognized that some of the treatment standards require measurement of analytes below published PQLs. Although the Agency contends that treatment residues may have matrices conducive to quantitation at levels below PQLs, they recognize that because of matrix effects, one cannot always quantitatively measure analytes at the level required by the treatment standard. Dow has found this to be true and, in fact, has already applied for variances from treatment standards as prescribed by previous Land Disposal Restriction regulations and as proposed here.

The variance procedure is not the way to handle this problem. While Dow has already recognized the need for variances for routine waste streams, this is only the tip of the iceberg. More than 90 percent of the waste codes that Dow handles are nonroutine wastes created by equipment clean-outs, off-spec batches, spills, etc. While these nonroutine wastes/codes represent less than 5 percent of the total volume, they represent a large portion of our analytical load. Disposal decisions, regulated/nonregulated decisions and restricted/nonrestricted decisions must be made for each waste code prior to handling. Since the present variance system requires 100% compliance until the variance is granted, a facility must predict whether or not it will be able to meet the required detection limits. However, there is no way to anticipate matrix effects for these wastes or their treatment residues. Therefore a variance cannot be obtained which will ensure continued compliance.

Dow proposes that EPA adopt a procedure that whenever an analyte's concentration cannot be determined at the regulatory (or restricted) level, one is assumed to be in compliance if the concentration is below the quantification level. The laboratory would be required to use appropriate analytical methods including mandated quality control. The laboratory would then establish a quantitation limit for the analyte in the matrix in light of the specified quality control requirements. Dow would be happy to discuss with EPA the details of just how such matrix specific quantitation limits could be measured and documented. Such documentation would be retained by the generator/disposer to verify compliance.

Comment Number: 46-Fi-5

Docket Number: LD12 - 00179

Commenter: The Dow Chemical Company

Issue: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: PQL/Analytical Issues

Response:

See response 1-D-8.

1/4

Comment Number: 46-Fi-6

Docket Number: LD12-L0007

Commenter: Chemical Manufacturers Association

Issue: ISSUE CODE 46: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: PQL/Analytical Issues

Comment:

The Agency Should Prescribe a Procedure for Obtaining a Variance From a Treatment Standard When Compliance Cannot Be Demonstrated Due to Waste Matrix Interferences.

In section III.A.1.e.(3) of the proposed rule (54 Fed. Reg. at 48,385), the Agency describes the relationship between the practical quantitation limits (PQLs) published in Test Methods for Evaluating Solid Wastes, (SW-846), September 1986, and the BDAT standards, especially those that are based on detection limits. EPA states that when a facility believes that waste-specific treatment standards cannot be met because its laboratory is unable to achieve PQLs below the treatment standards on a specific waste residual, the facility may petition the Agency for a variance from the treatment standards for that particular waste code. CMA does not believe that treatment standards should be set below PQLs. If, however, a facility cannot demonstrate compliance with a BDAT standard because of matrix interferences in its particular waste, then the facility should be able to obtain a variance, and EPA should specify a procedure for obtaining such a variance.

cont.

2/4

Comment Number: 46-Fi -6 (continued)

Docket Number: LD12-L0007

Commenter: Chemical Manufacturers Association

Issue: ISSUE CODE 46: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: PQL/Analytical Issues

Comment:

CMA has emphasized in previous comments the importance of using a quantitation level, rather than a detection limit, as the basis for enforceable standards. Since compliance with the treatment standards will be assessed by both the waste treater and regulatory agencies, standards that are based on PQLs should account for the expected uncertainties that are inherent to the analytical methods, as well as the limitations presented by matrix-specific interferences.

The problem of demonstrating compliance with treatment standards that are based on detectable levels of hazardous constituents is much greater for characteristic wastes and "P" and "U" wastes, which may exist in a very wide range of matrices such as soils, sludges, or wastewaters. Although the Agency argues that the problems of matrix interference should be reduced for those nonwastewaters that have standards based on incineration, they are not eliminated. Some waste treaters, especially those that are treating characteristic, "P", and "U" wastes, may be unable to achieve BDAT standards that are based on detection limits because of an inability to measure compliance.

cont.

3/4

Comment Number: 46-Fl-6 (continued)

Docket Number: LD12-L0007

Commenter: Chemical Manufacturers Association

Issue: ISSUE CODE 46: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: PQL/Analytical Issues

Comment:

If EPA persists in establishing BDAT standards based on detection levels, rather than PQLs, treaters will be required to apply for waste-specific standards. EPA should therefore specify the procedure that is to be used to establish the waste/treatment-specific detection or quantitation limits. CMA recommends the following approach.

Since it is impractical for most waste treaters to develop an interlaboratory PQL, a quantitation level based on a single-laboratory study by the laboratory that is responsible for demonstrating continued compliance with the standard for the waste in question should be acceptable. CMA believes that the protocol provided in SW-846 for estimating the Method Detection Limit (MDL) should be used to establish the detection (not quantitation) limit for the treated waste matrix. This procedure is an accepted and proven basis for estimating the ability to detect the presence of a chemical in a waste at a 99 percent confidence level. The MDL measured for a specific waste can then be converted to a single-laboratory quantification limit (PQL) by multiplying it by 3.33. This is the relationship between the limit of detection and limit of quantitation that has been recommended by the American

Cont.

4/4

Comment Number: 46-Fi-6 (Continued)

Docket Number: LD12-L0007

Commenter: Chemical Manufacturers Association

Issue: ISSUE CODE 46: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: PQL/Analytical Issues

Comment:

Chemical Society in its "Principles of Environmental Analysis" (*Analytical Chemistry*, Volume 55, pages 2210-2218, December 1983). A PQL established in this way represents an uncertainty of plus or minus 30 percent in the measured concentration at the 99 percent confidence level. It should be emphasized that the single-laboratory PQL established by this procedure is more restrictive than the PQLs typically used by EPA, which account for both interlaboratory uncertainty and waste matrix effects.

Comment Number: 46-Fi-6

Docket Number: LD12 - L0007

Commenter: Chemical Manufacturers' Association

Issue: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: PQL/Analytical Issues

Response:

See response 1-D-19.

1/2

Comment Number: 46-Fii -1

Docket Number: LD12-00159

Commenter: WASTE MANAGEMENT, INC. and CHEMICAL WASTE MANAGEMENT, INC.

Issue:

Subissue: ISSUE CODE 46: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Comment: PQL/Analytical Issues

IV. Analytical, Testing and Samplings Methods

A. Practical Quantitation Levels (54 Fed. Reg. at 48,385)

1. Definition of Practical Quantitation Limits

In its discussion of the relationship of treatment standards to PQLs, EPA quoted the definition of PQL from SW-846 as "the lowest level of quantification that the Agency believes a competent laboratory can be expected to reliably achieve." Missing from this quotation is the critical language in SW-846: ". . . within the specified limits of precision and accuracy during routine laboratory operating conditions." SW 846, 3rd Ed, ONE-9.

This language cannot be omitted. As quoted by EPA, the definition of PQL suggests that a clear, specific mechanism is available to evaluate a laboratory as being "competent." A national certification program to determine competency does not exist. Without specific guidance from EPA, any laboratory would consider itself to be competent.

WMI also suggests that in the preamble to the final rule, EPA should refer to the clear discussion and example of determining precision and accuracy found in 54 Fed. Reg. at 22,100 (May 22, 1989), which must be used for generation of the PQL.

cont.

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Comment Number: 46-Fii -1 (Continued)

Docket Number: LD12-00159

Commenter: Waste Management, Inc. and Chemical Waste Management, Inc.

Issue: ISSUE CODE 46: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: PQL/Analytical Issues

Moreover, EPA should specify a procedure for adequately determining method detection limits (MDLs) and the resultant factored Practical Quantitation Limits. Most laboratories determine MDLs and PQLs from analytical runs on one day, with one instrument and one operator. This practice does not take into consideration the variability of data generated by several analysts on different days using different instruments or the matrix variation or sampling variation. Such variability must be taken into account.

Comment Number: 46-Fii-1

Docket Number: LD12 - 00159

Commenter: Waste Management, Inc. and Chemical Waste Management, Inc.

Issue: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: PQL/Analytical Issues

Response:

See response 1-D-5.

Comment Number: 46 - Fiii-1

Docket Number: LD12-00159

Commenter: Waste Management, Inc. and Chemical Waste Management, Inc

Issue: ISSUE CODE 46: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue PQL/Analytical Issues

11. Reliability and Correction Factors

In the preamble, EPA explains that "the data (the average detection limit) are adjusted through use of the variability factor (typically 2.8) and a correction for recovery of a spiked analyte (or surrogate)." 54 Fed. Reg. at 48,386. Variability factors and correction factors should also be taken into consideration when determining PQLs.

The adjustment described is not in accordance with EPA's standard methods, however. The analytical methods in SW-846 do not allow for adjustment of concentration based on recoveries of surrogates. If the surrogate recovery is greater than 100%, this technique would require the analyst to lower the measured amount of a target analyte by the same percentage.

Spike recoveries and surrogates must be controlled but should not be used to factor other constituents.

Finally, the averaged detection limit adjusted by various factors may not necessarily satisfy the definition of PQL in SW-846, 3rd Edition.

Comment Number: 46-Fiii-1

Docket Number: LD12 - 00159

Commenter: Waste Management, Inc. and Chemical Waste Management, Inc.

Issue: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: PQL/Analytical Issues

Response:

See response 1-D-5.

46 - Fiv - 1
LD12-00159

Comment Number: Waste Management Inc. and Chemical Waste Management

Docket Number: ISSUE CODE 46: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Commenter: PQL/Analytical Issues

Issue: 3. Determination of Method Detection Limit

Subissue:

EPA has explained that, in SW-846, "[t]he discussion further defines PQLs as the method detection limit in reagent water (from Table 1, pp. 8250-2, 8250-3, and 8250-4) multiplied by a matrix-dependent factor that was estimated for four matrices (Table 2, p. 8250-5)." 54 Fed. Reg. at 48,385. This statement prompts four concerns.

First, the procedure for determining the MDL is suitable for a single channel instrument such as a gas chromatograph. It is not suitable for a multi-channel instrument such as a GC/MS because when the ion abundance for the quantification ion is present at the lowest amount measurable, the confirmatory ions are not detectable.

Second, a specific procedure for MDL determination is lacking. By leaving the process up to interpretation, laboratories will generate the values in a variety of ways.

Third, EPA presents no supporting evidence for the matrix factors. Arbitrary selection of values allows laboratories to choose different arbitrary values based on "their experience."

Fourth, the use of MDLs in reagent water has no applicability to the instances where "the corresponding treatment standards for these constituents are based on an analysis of total constituent concentrations in a representative sample of the treated waste." 54 Fed. Reg. at 48,384. The MDLs for destructive technology must be determined in the treated waste.

Comment Number: 46-Fiv-1

Docket Number: LD12 - 00159

Commenter: Waste Management, Inc. and Chemical Waste Management, Inc.

Issue: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: PQL/Analytical Issues

Response:

See response 1-D-5.

Comment Number: 46-Fv-1

Docket Number: LD12-00159

Commenter: WASTE MANAGEMENT, INC. and CHEMICAL WASTE MANAGEMENT, INC. (continued)

Issue: ISSUE CODE 46: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: PQL/Analytical Issues

Comment:

5. Matrix-Dependent Correction Factors

In its proposal, EPA explains that "matrix dependent correction factors . . . do not specifically apply to any particular treatment residuals (i.e., only correction factors for matrices identified as ground water, low-level soil, high-level soil, and non-water miscible waste." 54 Fed. Reg. at 48,385.

WMI urges EPA to specify chemical and physical characteristics for use in categorization of matrices. For example, all soils are not equal. Presumably, the "soil" used in EPA's study was an actual soil containing organic matter and mineral matter. In that case, the adsorption of semi-volatile organics would be related to the percentages of organic matter in the humic and fulvic fractions and to the amount and type of clay. From soil to soil, these components differ; therefore, the matrix-dependent correction factor is probably valid for only the soil specific used in the study.

Matrix-dependent factors do not yield analytical results. For example, a factor is used in a method for analyzing organic matter content in soils, but the method is only applicable to soils of a certain mineralogy from a certain geographic and climatic region.

No definition of "non-water miscible waste" is given.

Comment Number: 46-Fv-1

Docket Number: LD12 - 00159

Commenter: Waste Management, Inc. and Chemical Waste Management, Inc.

Issue: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: PQL/Analytical Issues

Response:

See response 1-D-5.

46-Fvi-1

Comment Number: LD12-00159

Docket Number: Waste Management Inc. and Chemical Waste Management

Commenter: ISSUE CODE 46: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Issue: PQL/Analytical Issues

Subissue:

6. Revision of Correction Factors and MDLs

EPA announces that it is "currently modifying and expanding the matrix correction factors, as well as modifying the detection limits from which the PQLs are derived." 54 Fed. Reg. at 48,385. The regulated community should not be held to "standards" that are in essence "moving targets." The matrix factors, detection limits and procedures for their determination should be finalized before becoming requirements.

Comment Number: 46-Fvi-1

Docket Number: LD12 - 00159

Commenter: Waste Management, Inc. and Chemical Waste Management, Inc.

Issue: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: PQL/Analytical Issues

Response:

See response 1-D-5.

Comment Number: 46-Fuii-1

Docket Number: LD12-00159

Commenter: Waste Management, Inc. and Chemical Waste Management, Inc.

Issue: ISSUE CODE 46: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue. PQL/Analytical Issues

8. Reliability of Data

WMI disagrees with EPA's assertion that "the laboratories used to develop the treatment standards are reliable and must maintain compliance with EPA's Quality Assurance/Quality Control requirements on a routine basis." 54 Fed. Reg. at 48,385. At this time, there are no mandatory QA/QC requirements other than those specifically found in RCRA required methods. Standards proposed on January 23, 1989 (54 Fed. Reg. at 3,212) have not been promulgated. Thus, there is no assurance that EPA's QA/QC procedures are routinely followed.

Even if CLP contractor laboratories were used in the development of the treatment standards, no such assurance exists. Usually, less than 10% of the data supplied under these contracts are evaluated for compliance to QA/QC criteria.

EPA should make the data quality objectives (DQOs) for these analytical projects available for review by the regulated community. Realistic detection limits are essential to thorough evaluation of the performance of a laboratory.

Comment Number: 46-Fvii-1

Docket Number: LD12 - 00159

Commenter: Waste Management, Inc. and Chemical Waste Management, Inc.

Issue: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: PQL/Analytical Issues

Response:

See response 1-D-5.

Comment Number: 46-Fviii-1

Docket Number: LD12-00159

Commenter: Waste Management, Inc. and Chemical Waste Management, Inc.

Issue: ISSUE CODE 46: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: PQL/Analytical Issues

9. BDAT Generic Quality Assurance Project Plan

EPA states that to obtain a variance because PQLs are below treatment standards, a "facility must demonstrate that the analyses are in compliance with all other BDAT QA/QC provisions (as outlined in the BDAT Generic Quality Assurance Project Plan)." 54 Fed. Reg. at 48,385. There is no discussion of PQLs in the BDAT Generic QAPP, however. Instrument detection limits are mentioned but no relationship to PQLs is described. This deficiency needs to be addressed.

The BDAT Generic QAPP also specifies that the recovery data will be used to adjust the values for the unspiked samples. The defensibility of the data is highly questionable if the spike recovery does not meet an acceptance criteria based on repetitive spikes at a level determined to be recoverable. A significantly low or high recovery does not preempt the possibility of operator error or method applicability.

Finally, the BDAT QAPP does not enumerate any surrogate recovery criteria. If any method not in SW-846 is used following this guidance, the results from that method will be highly questionable.

Comment Number: 46-Fviii-1

Docket Number: LD12 - 00159

Commenter: Waste Management, Inc. and Chemical Waste Management, Inc.

Issue: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: PQL/Analytical Issues

Response:

See response 1-D-5.

Comment Number: 46 - Fix - 1 PQL/Analytical Issues

Docket Number: LD12 - 00159

Commenter: Waste Management, Inc. and Chemical Waste Management, Inc.

Issue:

Subissue:

ISSUE CODE 46: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

10. Analytical Methods

EPA notes that "The Agency may use analytical methods that are not specifically identified in SW-846." 54 Fed. Reg. at 48,385. WMI objects to this statement and to any reliance by the Agency on non-standardized methods in developing treatment standards.

The Agency should not allow itself or the regulated community to use non-standard methods for the RCRA program. The only way to achieve a reasonable level of quality in data is to impose maximum standardization of methods and adopt the quality assurance standards proposed on January 23, 1989 in final form. Without standardized methods, treatment standards cannot be properly implemented or enforced.

Data comparability is dependent upon using the same method or, at the very least, ensuring the statistical characteristics of the databases in question have no significant differences. Unless treatment standards are developed using required extraction techniques and published standard methods, there is no reason to assume that laboratories used by the regulated community will be able to demonstrate compliance with the treatment standards. At the least, EPA must identify and publish for examination by the public any alternative methods used in developing the treatment standards.

Comment Number: 46-Fix-1

Docket Number: LD12 - 00159

Commenter: Waste Management, Inc. and Chemical Waste Management, Inc.

Issue: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: PQL/Analytical Issues

Response:

See response 1-D-5.

1/2

Comment Number: 46-Fx - 1

Docket Number: LD12-00151

Commenter: GULF COAST WASTE DISPOSAL AUTHORITY

Issue: ISSUE CODE 46: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue:

Comment: PQL/Analytical Issues

III.A.1.e.

Analytical Requirements and Relationship of PQLs to BDAT

The Agency states that a variance from a treatment standard may be obtained, if it is shown that the waste matrix interferes with the applicable SW-846 analytical method so that compliance cannot be demonstrated.

The Agency does not prescribe a procedure for obtaining a variance for obtaining relief from a standard for which compliance cannot be measured with available analytical methods. To avoid administrative problems in obtaining what should be a straight-forward variance, EPA should specify the procedures that must be followed to obtain a treatability variance for analytical inability to measure at the prescribed level.

In section III.A.1.e.(3) of the proposed rule, the Agency describes the relationship between the practical quantitation limits (PQLs) published in *Test Methods for Evaluating Solid Wastes*, (SW-846), September 1986, and the BDAT standards, especially those that are based on detection limits. EPA states that when a facility believes that waste-specific treatment standards cannot be met because their laboratory is unable to achieve PQLs below the treatment standards on a specific waste residual, the facility may submit a petition for a variance from the treatment standards for that particular waste code. GCA supports this position, however, there is no specified procedure in SW-846 for determining a PQL. Furthermore, because the treatment standards are based on method detection limits (MDLs), not PQLs, the procedures used to estimate these limits do not consider either the quantification of the constituent of interest nor the interlaboratory component of analytical uncertainty.

In order to have the petition for variance for adjustment of a BDAT standard reflect analytical capabilities for a specific waste, EPA must provide a more explicit definition of the protocols that should be used to define the MDL or PQL for a specific waste matrix. The first step should be to define whether or not the standard should be based on detection (an MDL) or quantification (a PQL).

Cont.

Comment Number: 46 - Fx - 1 (Continued)

Docket Number: LD12-00151

Commenter: GULF COAST WASTE DISPOSAL AUTHORITY (continued)

Issue: ISSUE CODE 46: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: PQL/Analytical Issues

Comment:

The problem of demonstrating compliance with treatment standards that are based on detectable levels of hazardous constituents is great for characteristic wastes and P and U wastes, which may exhibit a very wide range of matrices. They may consist of soil matrices, sludge matrices, or wastewaters. Although the Agency argues, with some merit, that for those nonwastewaters that have standards based on incineration the problems of matrix interference should be reduced, they are not eliminated. It is probable that some waste treaters, especially those that are treating characteristic, P, and U wastes, and multi-source leachate, may not be able to achieve those BDAT standards that are based on detection limits.

Since this result will require such treaters to apply for waste-specific standards, EPA should specify the procedure that is to be used to establish the waste/treatment-specific detection or quantitation limits. GCA recommends the following approach.

Since it is impractical for most waste treaters to develop an interlaboratory PQL, a quantitation level based on a single-laboratory study by the laboratory that is responsible for demonstrating continued compliance with the standard for the waste in question should be acceptable. GCA believes that the protocol provided in SW-846 for estimating the MDL should be used to establish the detection (not quantitation) limit for the treated waste matrix. This procedure is an accepted and proven basis for estimating the ability to detect the presence of a chemical in a waste at a 99 percent confidence level. The MDL measured for a specific waste can then be converted to a quantification limit (PQL) by multiplying it by 10. This is the the procedure that the Agency has typically used to establish PQLs.

Comment Number: 46-Fx-1

Docket Number: LD12 - 00151

Commenter: Gulf Coast Waste Disposal Authority

Issue: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: PQL/Analytical Issues

Response:

See response 1-D-4.

Comment Number: 46-Fx -2

Docket Number: LD12-00179

Commenter: THE DOW CHEMICAL COMPANY

Issue: ISSUE CODE 46: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: PQL/Analytical Issues

Comment:

IV. RELATIONSHIP OF TREATMENT STANDARDS TO PRACTICAL QUANTIFICATION LIMITS (PQLs).

54 Fed. Reg. 48,385 column 2

EPA has recognized that some of the treatment standards require measurement of analytes below published PQLs. Although the Agency contends that treatment residues may have matrices conducive to quantitation at levels below PQLs, they recognize that because of matrix effects, one cannot always quantitatively measure analytes at the level required by the treatment standard. Dow has found this to be true and, in fact, has already applied for variances from treatment standards as prescribed by previous Land Disposal Restriction regulations and as proposed here.

The variance procedure is not the way to handle this problem. While Dow has already recognized the need for variances for routine waste streams, this is only the tip of the iceberg. More than 90 percent of the waste codes that Dow handles are nonroutine wastes created by equipment clean-outs, off-spec batches, spills, etc. While these nonroutine wastes/codes represent less than 5 percent of the total volume, they represent a large portion of our analytical load. Disposal decisions, regulated/nonregulated decisions and restricted/nonrestricted decisions must be made for each waste code prior to handling. Since the present variance system requires 100% compliance until the variance is granted, a facility must predict whether or not it will be able to meet the required detection limits. However, there is no way to anticipate matrix effects for these wastes or their treatment residues. Therefore a variance cannot be obtained which will ensure continued compliance.

Dow proposes that EPA adopt a procedure that whenever an analyte's concentration cannot be determined at the regulatory (or restricted) level, one is assumed to be in compliance if the concentration is below the quantification level. The laboratory would be required to use appropriate analytical methods including mandated quality control. The laboratory would then establish a quantitation limit for the analyte in the matrix in light of the specified quality control requirements. Dow would be happy to discuss with EPA the details of just how such matrix specific quantitation limits could be measured and documented. Such documentation would be retained by the generator/disposer to verify compliance.

Comment Number: 46-Fx-2

Docket Number: LD12 - 00179

Commenter: The Dow Chemical Company

Issue: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: PQL/Analytical Issues

Response:

See response 1-D-8.

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Comment Number: 46 - Gi - 1

Docket Number: LD12- 00116

Commenter: MONSANTO COMPANY

Issue: ISSUE CODE 46: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: Miscellaneous Halogenateds

Comment:

E. U062 - Diallate

The Agency's rationale for proposing specific technology as BDAT standards for many wastes, including diallate (U062) rather than performance level BDAT standards, is included in Section III.A. of the preamble of the Land Disposal Restrictions for Third Scheduled Wastes; Proposed Rule. At Section III.A.2.f.(7), 54 FR 48406, the Agency discusses its proposed specific technology standard for diallate (U062) wastewater and non-wastewater, as well as wastewater and non-wastewater containing 3 other chlorinated organo-sulfur chemicals. The Agency refers to the discussion in Section III.A.2.a.(4) as the basis for proposing the specific technology BDAT standards for wastewaters containing these chemicals.

Section III.A.2.a.(4) discusses proposed specific technology standards for halogenated wastewaters. EPA states that analytical complications discussed in Section III.A.1.h.(2) preclude establishment of performance level BDAT for some halogenated organic containing wastewaters, and thus the Agency proposes specific technology as BDAT. While the rationale presented in Section III.A.1.h.(2) may be applicable to some wastewaters containing halogenated organic chemicals, the rationale is not applicable to diallate (U062) wastewater.

Referencing the EPA's issues of concern cited at Section III.A.h.(2), Monsanto argues that these issues are not a concern relative to diallate (U062) wastewater, as follows:

1. Availability of Verified Analytical Method (54 FR 48387)

   At 40 CFR 264 Appendix IX, EPA references Method 8270 for analyzing diallate in groundwater. The method is included in SW-846, and EPA states that the method PQL (practical quantification limit) for diallate is 0.01 mg/ℓ.

   The Agency also states that it is concerned with HPLC methods used to analyze for many U and P chemicals. In the case of diallate, EPA's concern is irrelevant since EPA Method 8270 is a GC/MS method.

   Monsanto has used EPA Method 8270 for analyzing diallate (U062) wastewater and has not observed any matrix interference problems. A verified analytical method is available for diallate (U062) wastewater.

cont.

Comment Number: 46-Gi-1 (Continued)

Docket Number: LD12-00116

Commenter: MONSANTO COMPANY (continued)

Issue: ISSUE CODE 46: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: Miscellaneous Halogenateds

Comment:

2. **Commercial Availability of Calibration Standards (54 FR 48388)**

   There are at least two sources of diallate standards in the commercial market. Supelco (800/247-6628) offers the standard at catalog #4-8293R and Chem Services (215/692-3026) offers the standard at catalog #Ps-507.

3. Stability in Water (54 FR 48388)

   Diallate is very stable in water. It is a pesticide that when used for its intended purpose is exposed to air, water, and soil. The Herbicide Handbook of the Weed Science Society of America (fifth edition, 1983) reports that diallate is highly resistant to ultraviolet radiation, has a decomposition temperature greater than 200°C, has an indefinitely stable storage life, and negligible volatilization or photodecomposition.

   Groundwater sampling at a Monsanto manufacturing location over a 10 year period indicates that diallate is biologically recalcitrant in groundwater. The data collected during this time period also indicate that extending sample hold time does not affect sample concentrations.

4. Multiple or Ambiguous Identity (FR 54 48388)

   EPA's concern that available analytical methods would be unable to identify all salts and metabolites is not applicable to diallate. The value reported by EPA Method 8270 is the sum of diallate's 2 isomers, cis- and trans-.

   Considering the above, analytical complications are not a concern, and thus, a performance level BDAT standard can be established. Monsanto proposes that 0.05 mg/ℓ be established as the performance level BDAT standard for diallate (U062) wastewater. Monsanto's proposal is supported as follows:

1. Calgon Corporation conducted a treatability study on behalf of Monsanto and demonstrated that diallate can be removed from wastewater with granular activated carbon treatment alone to levels consistently below 0.05 mg/ℓ when the influent concentration ranged from 0.28-0.34 mg/ℓ (See Attachment D). Although performance levels of less than 0.01 mg/ℓ were attained in the study before breakthrough of the carbon bed occurred, a perform-

cont.-

3/9

Comment Number: 46-Gi-1 (Continued)

Docket Number: LD12-00116

Commenter: MONSANTO COMPANY (continued)

Issue: ISSUE CODE 46: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: Miscellaneous Halogenateds

Comment:

ance level BDAT set at 0.05 mg/ℓ would allow for variability, channeling that could be expected in a full scale unit, and treatment of influent wastewater containing diallate in concentrations higher than those of the Calgon treatability study.

2. EPA states that the practical quantification level of the available analytical method for diallate (EPA Method 8270) is 0.01 mg/ℓ. BDAT set at 0.05 mg/ℓ would allow for a reasonable variability factor and dilution of samples as required to remedy possible site specific analytical method interference issues.

3. A BDAT of 0.05 mg/ℓ diallate concentration in land disposed wastewater is protective of short term and long term human health and the environment, without regard to the added safety factor afforded by dilution effects as the waste hypothetically might migrate toward a receptor. Monsanto has calculated a "maximum contaminant level goal" (MCLG) using EPA protocols and has determined that an appropriate MCLG for diallate would be 0.4 mg/ℓ (See Attachment E).

cont.

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Comment Number: 46-Gi-1 (Continued)

Docket Number: LD^{12} 00116

Commenter: Monsanto

Issue: ISSUE CODE 46: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: Miscellaneous Halogenateds

Comment:

ATTACHMENT D

CALGON
CALGON CARBON CORPORATION

CALGON CARBON CORPORATION 4343 COMMERCE COURT, SUITE 400, LISLE, IL 60532 (708) 505-1919

December 28, 1989

Mr. William Conner
Monsanto Agricultural Company
P.O. Box 473
Muscatine, IA 52761

Dear Bill:

Calgon Carbon recently performed an Accelerated Column Test (ACT) on a representative sample of your groundwater contaminated with diallate. The ACT simulated a single stage adsorption system as designed by Calgon Carbon, operating at a flow rate of approximately 400 gpm and utilizing 20,000 lbs. of Calgon Carbon's Filtrasorb 300 GAC. Samples were collected and sent to CompuChem for specific analyses.

Analysis of the influent groundwater indicated that diallate concentrations ranged between 340 ppb and 280 ppb. The Filtrasorb 300 carbon was shown to be effective at removing the diallate to below detection limits (10 ppb) through a volume of approximately 22.6 million gallons of groundwater treated. The CompuChem data is listed in Table I.

Calgon Carbon has also reviewed the Material Safety Data for diallate and we fully expect to be able to accept the spent carbon generated by this groundwater application. As with any application where Calgon Carbon supplies our reactivation services, formal acceptance testing must be performed on an actual sample of carbon subjected to the groundwater. In your case, this would be shortly after installation of an adsorption system.

I look forward to assisting you on this project and helping you to achieve your groundwater effluent requirements. Please let me know if I can be of further assistance.

cont.

46-Gi-1 (Continued)
LDa-00116
Monsanto

ISSUE CODE 46: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Miscellaneous Halogenateds

TABLE I

CompuChem ID #	Diallate Effluent Concentration (ppb)	Simulated Gallons Treated MM
309328	BDL	0.1
309330	BDL	0.3
309321	BDL	22.6
309310		22.8
309320	33	42
309322	46	42.1
309329	86	60.6

CompuChem ID #	Diallate Influent Concentration (ppb)
309323	320
309324	320
309316	290
309317	280
309318	340
309307 or 317	280

cont.

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Comment Number: 46 - Gi - 1 (Continued)

Docket Number: LD12-00116

Commenter: Monsanto

Issue: ISSUE CODE 46: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: Miscellaneous Halogenateds

Comment:

Very truly yours,

Edward T. Ricketts
Technical Sales Representative

ETR:sk
Att.
cc: Mr. Jeff Klieve
Mail Zone C25B
Monsanto Company
800 N. Lindbergh
St. Louis, MO 63167

cont'

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Comment Number: 46-Gi-1 (Continued)

Docket Number: LD12-00116

Commenter: Monsanto

Issue: ISSUE CODE 46: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: Miscellaneous Halogenateds

Comment:

Monsanto

ATTACHMENT 3

FROM
NAME-LOCATION-PHONE C. H. FARR C2SE 4-8810 MAC TOXICOLOGY

DATE December 22, 1989

SUBJECT Diallate *de minimis* Water Level

REFERENCE

TO Bill Conner - 1630

cc
T. W. Fuhremann - C2SE
D. P. Ward - C2SE
J. R. Klieve - C2SB
D. B. Redington - A3NA

The EPA has not formally evaluated or classified the carcinogenic potential of diallate. However, the International Agency for Research on Cancer (IARC) has evaluated the readily available carcinogenicity and mutagenicity data for diallate and summarized these studies with a conclusion that experiments conducted by the National Cancer Institute (NCI), in mice, at 500 mg/kg, provide *limited evidence* that diallate is carcinogenic to experimental animals (IARC 30, 235-244; 1983). A rat study, also conducted by NCI, was considered by IARC to be inadequately reported with too few data for a full evaluation. However, the authors of the rat study, did consider their results to be negative for carcinogenic effects. IARC also summarized several *in vivo and in vitro* assays designed to evaluate genotoxic effects of diallate. No mutagenic effects were noted in a mouse dominant lethal test, while genotoxic effects were observed in cultured microbial and mammalian cells and in Drosophila following diallate treatment.

Based on these results, IARC concluded that the data are insufficient to evaluate the carcinogenicity of diallate to humans - IARC Group 3. I agree with this IARC classification.

cont.

Comment Number: 46-Gi-1 (Continued)

Docket Number: LD12-00116

Commenter: Monsanto

Issue: ISSUE CODE 46: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: Miscellaneous Halogenateds

Comment:

Monsanto has conducted chronic feeding studies with diallate that were not evaluated by IARC. In these studies, diallate was fed in the diet to hamsters at levels of 20, 200 and 1000 ppm (1.4, 11.4, and 57.1 mg/kg) for 20 or 24 months for males and females, respectively. This study produced a suggestive, though not conclusive, increase in skin tumors; no other tissues were examined microscopically. Increased mortality and increased liver weights were reported in high-dose males.

When all available data bearing on its oncogenic potential are subjected to a weight-of-evidence analysis, it is my judgement that diallate meets the criteria to be placed in EPA category C. The EPA may require a quantitative risk assessment on a case by case basis, for materials judged to be in category C. In the case of diallate, a quantitative risk analysis would be inappropriate because the mouse studies were performed only at an MTD level and only one dosage was used; this would preclude the use of quantitative modes since no dose-response curve could be generated with one dose-level.

From the chronic hamster data, one may determine a *de minimis* water concentration by first calculating an RfD as an estimate, with an uncertainty factor, of a daily exposure that is likely to be without an appreciable risk of deleterious health effects for a lifetime.

$$\text{RfD} = \frac{11.4\ \text{mg/kg/day}}{1000} = 11.4\ \mu\text{g/kg/day}$$

where

11.4 = lowest chronic NOAEL based on absence of mortality and increased liver weight in hamsters.

1000 = Uncertainty factor of 100, , chosen in accordance with EPA or NAS/ODW guidelines for use with a NOAEL from an animal study. We have added an additional factor of 10 based on limited animal data.

A Drinking Water Equivalent Level (DWEL) can then be calculated as:

$$\text{DWEL} = \frac{11.4\ \mu\text{g/kg/day}\ (70\ \text{kg})}{2\ \text{l/day}} = 399\ \mu\text{g/l}$$

CC C.

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Comment Number: 46-Gi-1 (Continued)

Docket Number: LD12-00116

Commenter: Monsanto

Issue: ISSUE CODE 46: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue Miscellaneous Halogenateds

Comment:

where

11.4 μg/kg/day = RfD

70 Kg = assumed adult body weight

2 l/day = assumed daily water consumption of an adult

The usual final step in determining an advisory level for drinking water would be to factor in the assumed relative source contribution from water (usually assumed to be 20%). In this case this correction is not justified because diallate is no longer manufactured (thus no ambient environmental exposure), the diallate contamination is restricted to the plant site (restricting general population exposure), and no other significant sources of exposure are anticipated at the contaminated area.

The overall equation for an *de minimis* guideline is shown as:

$$de\ minimis\ \text{guideline} = \frac{(\text{NOAEL})(70\text{ kg})}{(\text{uncertainty factor})(2\text{ l water/day})}$$

$$= \frac{11.4\text{ mg/kg/day} \times 70\text{ kg}}{1000 \times 2\text{ l/day}}$$

$$= 399\ \mu\text{g/l or} \approx 400\text{ ppb}$$

In my opinion, 400 μg/l is a conservative estimate of a *de minimis* drinking water exposure level for diallate.

C. H. Farr

Comment Number: 46-Gi-1

Docket Number: LD12 - 00116

Commenter: Monsanto Company

Issue: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: Miscellaneous Halogenateds

Response:

In the proposed rule (Section III.A.2.f.(7), 54 Federal Register 48406, November 22, 1989), the Agency stated that a method of treatment is being proposed as the BDAT treatment standard for U062 (diallate) because U062 is amenable to analysis only by HPLC. EPA currently rejects HPLC methods as the sole means of establishing treatment standards, because it has not been completely verified that HPLC is appropriate for analysis of the matrices seen in either untreated wastes or treated waste residuals. The commenter claims that this rationale is not applicable to U062, because diallate can analyzed for by SW-846 Method 8270, a GC/MS method. Furthermore, the commenter provides data supporting a BDAT concentration-based treatment standard for U062 of 0.05 mg/L, based solely on carbon adsorption treatment performance.

EPA is promulgating methods of treatment as the BDAT treatment standard for both nonwastewater and wastewater forms of all sulfur-containing U and P wastes, including U062. Based of data provided by this and other commenters, EPA recognizes that U062 may be analyzable via SW-846 Method 8270. However, EPA, in evaluating the proposed BDAT treatment standards for the Third Scheduled U and P wastes prior to promulgation, has decided to set methods of treatment for all sulfur-containing U and P wastes, whether they are analyzable or not. These wastes are in the organo-sulfur waste treatability group (all of which are nonanalyzable) and in the chlorinated organo-sulfur subgroup of the miscellaneous halogenated organic waste treatability group. These wastes are being regulated similarly, regardless of their analyzable status, for the reasons discussed later in this response.

The Agency received two sets of data on the treatment of sulfur-containing wastes:

- Carbon adsorption treatment data from this commenter, and
- Chemical oxidation treatment data from another commenter.

These data were considered for use in establishing concentration-based treatment standards for these wastes; however, based on a thorough evaluation of the data, EPA determined that neither treatment method alone would be appropriate for establishing standards due to the range of influent values expected in these wastes. Nonetheless, EPA believes that oxidation followed by carbon adsorption would provide the best treatment. The Agency believes that carbon adsorption is a necessary step following oxidation, in order to ensure that the organic constituents are totally removed from the wastewater matrix. Not only does carbon adsorption provide a final polishing step, but the spent carbon becomes a nonwastewater form of the waste, which must be incinerated, thereby ensuring complete destruction of the organic constituents of concern. Carbon adsorption alone is not applicable to the treatment of these wastes because of the potential for breakthrough, a scenario to which even the commenter admitted. Since treatment performance data for this treatment train for these wastes or wastes judged to be similar are not available, EPA is unable to establish concentration-based treatment standards for these wastes.

EPA has decided to establish methods of treatment for all sulfur-containing U and P wastes, whether they are analyzable or not. The methods of treatment are incineration, or oxidation followed by carbon adsorption, for wastewaters. EPA believes that the incineration of these wastes is complicated by potential technical problems arising from the corrosive behavior and noxious odors of organic sulfur compounds. EPA is also concerned that since most of these sulfur-containing wastes are nonanalyzable, it will be difficult to monitor incinerator treatment efficiency for these wastes. During the comment period, several commenters urged the Agency to leave responsibility for air quality at hazardous waste treatment facilities to the RCRA permitting process and not to include air emission controls in the land disposal restriction regulations. In addition, EPA received no data characterizing SOx emissions or emission control systems from the incineration of these wastes. As a result, the Agency is setting methods of treatment as the BDAT treatment standard for these wastes, in order to allow permit writers the opportunity to make permit-by-permit determinations under the RCRA omnibus authority which are most appropriate to each unit that may burn these wastes.

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Comment Number: 46-Gii-1

Docket Number: LD12-00116

Commenter: MONSANTO COMPANY

Issue: ISSUE CODE 46: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: Miscellaneous Halogenateds

Comment:

I. P028 - Benzyl Chloride

The BDAT technology standard for P028 wastewaters and non-wastewaters should be modified to incorporate pollutant-specific concentration standards because adequate analytical procedures and QA/QC are available to set BDAT limits.

In the "Land Disposal Restrictions for Third scheduled Wastes; Proposed Rule" of November 22, 1989, at FR 48405, EPA groups together the two chlorinated methylbenzenes: Benzal Chloride (U017), and Benzyl Chloride (P028). They do so because of structural similarity. EPA lists both concentration-based treatment standards and an alternate technology standard for Benzal Chloride, U017, wastewaters and non-wastewaters. The concentration based treatment standards are transferred from K019 wastewaters and non-wastewaters. The proposed alternate technology standard (incineration for non-wastewater, incineration or wet air oxidation followed by carbon absorption for the wastewaters) is based on EPA's belief that Benzal Chloride (U017) is unstable in water, and that they have a concern that analyses for this compound in treatment residuals would not be reproducible. Similarly, EPA states that Benzyl Chloride, (P028), is also "unstable" in water. Unlike Benzal Chloride (U017), however, EPA is not proposing concentration-based standards, but a technology standard only. This is in direct conflict with their position that both compounds are similar.

The Agency states that they have no U017 or P028 analytical QA/QC data on hand, which appears to be their primary basis for proposing a technology standard. The following analysis will demonstrate why a treatment standard, not simply a technology standard, should be promulgated for this wastestream.

1. "Instability" of Benzyl Chloride in Water Will Not Cause Analytical Difficulties

Benzyl Chloride can undergo slow hydrolysis in water to form Benzyl Alcohol. Both Benzyl Chloride and Benzyl Alcohol are easily analyzed. EPA should have no qualms about analyzing for compounds which hydrolyze in or otherwise react with water, since the reaction products themselves will become the analyte. This is precisely what EPA has already done in the case of Phthalic Anhydride (the analyte is the corresponding Phthalic Acid).

cont.

Comment Number: 46-Gii-1

Docket Number: LD12-00116

Commenter: MONSANTO COMPANY (continued)

Issue: ISSUE CODE 46: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: Miscellaneous Halogenateds

Comment:

2. Benzyl Chloride Analyses are Very Reproducible

Monsanto is actively remediating an old past disposal area at our Bridgeport, NJ facility. It contains K015 residues from the distillation of Benzyl Chloride. The outside certified contract laboratory[9] for this groundwater remediation project routinely analyses for Benzyl Chloride, Benzyl Alcohol, Benzaldehyde, and Dichlorotoluene. The SW-846 protocol, method 8015 (direct injection GC), is the methodology used for the analyses. An external standard made from these four compounds, in five different concentrations, is used to quantify the levels of these compounds in the samples. The QA/QC methodology consists of a matrix spike, a duplicate matrix spike, a blank (deionized water), and a method blank (deionized water with a pure compound spike). This routine is repeated, and the results compared for accuracy and relative difference.

A key point is that the laboratory mixes Benzyl Chloride with water for a method blank, and routinely recovers greater than 86% of the compound, with a relative difference between QA/QC runs of less than 15%. Data from the QA/QC method-spikes for the last eight analyses are attached for your review (Attachment I). The data for the matrix spikes have been requested and will be forwarded to the Agency.

Therefore, while Benzyl Chloride can hydrolyze to Benzyl Alcohol, the rate is sufficiently slow that it does not preclude accurate and reproducible determinations of Benzyl Chloride in a water matrix. We believe the above data provide sufficient evidence to support concentration-based standards for Benzyl Chloride (P028).

Since Benzyl Chloride is structurally similar to both Benzal Chloride and other chlorinated benzenes, it follows that the treatment standards for K015, for the constituent Benzal Chloride, can be transferred to Benzyl Chloride (P028). This translates into proposed treatment standards as follows:

1) For P028 Wastewaters[10]

Benzyl Chloride	0.28 ppm
Benzyl Alcohol	0.28 ppm

2) For P028 Non-Wastewaters[11]

Benzyl Chloride	6.2 ppm
Benzyl Alcohol	6.2 ppm

cont.

3/3

Comment Number: 46-Gii-1

Docket Number: LD12-00116

Commenter: MONSANTO COMPANY (continued)

Issue: ISSUE CODE 46: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: Miscellaneous Halogenateds

Comment:

Based on the above analysis, a technology-only standard for Benzyl Chloride (P028), wastewaters and non-wastewaters, is inappropriate and should not be promulgated. Instead, concentration-based treatment standards, transferred from K015 wastewaters and non-wastewaters, should be applied to Benzyl Chloride (P028) wastewaters and non-wastewaters, respectively. This would allow meeting BDAT limits using alternative technologies.

---

[9] The analyses are conducted by O.H. Materials who are certified by the State of New Jersey. Certification number is 74603.

[10] The K015 Wastewater Standards were derived from the scrubber liquor analysis from K015 incineration.

[11] The K015 Non-Wastewater Standards were transferred from K019.

Comment Number: 46-Gii-1

Docket Number: LD12 - 00116

Commenter: Monsanto Company

Issue: **Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes**

Subissue: **Miscellaneous Halogenateds**

Response:

In the proposed Third Third rule, two chlorinated methylbenzenes, P028 (benzyl chloride) and U017 (benzal chloride), were grouped together because of structural similarity; however, whereas both concentration-based treatment standards and methods of treatment were the proposed BDAT treatment standards for U017 nonwastewaters and wastewaters, only methods of treatment were proposed for P028 nonwastewaters and wastewaters. The commenter believes that the BDAT treatment standard as a method of treatment for P028 wastewaters and nonwastewaters should be modified to pollutant-specific concentration standards because adequate analytical procedures and QA/QC are available.

The commenter suggests the use of a modified SW-846 method (8015) to quantify P028, benzyl chloride, but did not provide adequate documentation to prove that this method reliably quantifies benzyl chloride in a variety of waste treatment residual matrices.

In establishing treatability groups, EPA grouped P028 and U017 together because they have similar chemical structures. This grouping does not imply that all analytical aspects of both compounds are also similar. The Agency is able to promulgate concentration-based treatment standards for U017 wastewaters because it has multi-source leachate data to support a treatment standard calculation; similar data for P028 wastewaters is not available. In addition, EPA's rationale for specifying methods of treatment as the BDAT treatment standard for P028 wastewaters (that benzyl chloride is not amenable to quantification for BDAT because there is no EPA-approved analytical method currently available for it in SW-846) is still valid. Benzyl chloride does break down in water, and as a result there are no representative method detection limits available on which to establish a concentration-based treatment standard.

The Agency has also decided to promulgate a method of treatment (incineration) as the BDAT treatment standard for U017, based on an incinerator ash study which determined that U017 was difficult to analyze for in incinerator ash. The proposed concentration-based BDAT treatment standard for U017 nonwastewaters is not being promulgated. It follows that a method of treatment will also be promulgated as the BDAT treatment standard for P028 nonwastewaters.

Comment Number: 46-Giii-1

Docket Number: LD12-00179

Commenter: THE DOW CHEMICAL COMPANY

Issue: ISSUE CODE 46: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: Miscellaneous Halogenateds

Comment:

Examples where proposed treatment standards are inappropriate include:

-- page 48,407, (column 1) U043 (vinyl chloride)

Based on analytical data collected on incinerator ash for the analysis of vinyl chloride (U043), it is clear that the proposed treatment standard for non-wastewaters is too low. A Dow facility conducted analyses for the entire BDAT list of constituents three times on incinerator ash. The results of these analyses revealed nondetectable concentrations of vinyl chloride at a detection limit of 200 ppb. Utilizing EPA's protocol for determining treatment standards, this correlates to a treatment standard of 560 ppb. EPA should therefore finalize the U043 (vinyl chloride) treatment standard at a value not less than 560 ppb. (Supporting QA/QC data for the values presented here can be found in the attached analytical reports.)

Comment Number: 46-Giii-1

Docket Number: LD12 - 00179

Commenter: **The Dow Chemical Company**

Issue: **Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes**

Subissue: **Miscellaneous Halogenateds**

Response:

The commenter stated that the proposed concentration-based BDAT treatment standard for U043 (vinyl chloride) nonwastewaters of 0.035 mg/kg (35 ppb) is too low. The commenter conducted analyses for the entire list of BDAT list constituents three times on incinerator ash, and claims that the U043 detection limit was 200 ppb, which would correlate to a treatment standard of 560 ppb (0.56 mg/kg) using EPA's protocol for determining treatment standards.

The Agency is promulgating a concentration-based BDAT treatment standard of 29 mg/kg (29,000 ppb) for U043 nonwastewaters. Proposed nonwastewater treatment standards were based on constituent detection limits from ash collected during 14 EPA treatability tests conducted at five different incinerators. The U043 treatment standard was proposed based on the highest ash detection limit for U043 from the tests in which it was detected. In the case of U043 nonwastewaters, the proposed standard of 0.035 mg/kg was based on an ash detection limit of 0.01 mg/kg from the one test in which U043 was detected. The Agency has decided that this detection limit may be an outlier and therefore will not use it to promulgate the treatment standard. When the constituent is not detected in the treated or untreated waste in any of the tests, as is the now the case, the corresponding treatment standard is based on the highest ash detection limit for the constituent in the other tests. As a result, EPA is basing the U043 nonwastewater treatment standard on the ash detection limit from the K001-Creosote incineration test, which had the highest ash detection limit of all the other incineration tests. The detection limit was 10 ppm and the corresponding treatment standard is 29 ppm (29 mg/kg).

The concentration-based BDAT treatment standard for nonwastewater forms of U043 was not promulgated based on this commenter's data, because they did not supply sufficient waste characterization or incinerator process data; however, the commenter's data indicates that industry should have no problems meeting this treatment standard.

Comment Number: 46-Giv-1

Docket Number: LD12-00128

Commenter: VULCAN MATERIALS COMPANY

Issue: ISSUE CODE 46: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: Miscellaneous Halogenateds

Comment:

Vulcan believes that the division of the halogenated organics into six general categories is a reasonable approach and believes that the application of incineration technology to halogenated U and P chemicals is appropriate and cost effective. We are concerned with the emphasis in this section on the use of rotary kilns. Other types on incinerators are as effective and in some instances, more effective than rotary kiln incinerators and the use of liquid and gas phase incinerators should also be considered as BDAT for the halogenated organics.

Comment Number: 46-Giv-1

Docket Number: LD12 - 00128

Commenter: Vulcan Materials Company

Issue: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur, and Organo-Nitrogen Compound Wastes

Subissue: Miscellaneous Halogenateds

Response:

When incineration is specified as a method of treatment, any type of RCRA permitted incinerator may be used. When rotary kiln incineration data are used to set concentration-based treatment standards, any treatment technology, including any type of RCRA permitted incinerator, may be used provided that treated wastes meet the applicable BDAT treament standards.

Comment Number: 46-Gv-1

Docket Number: LD12-00128

Commenter: Vulcan Materials Company

Issue: ISSUE CODE 46: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: Miscellaneous Halogenateds

Comment:

Technologies for Halogenated Wastewaters

The Agency has identified twenty-five specific halogenated organic wastes and proposed three treatment technologies as alternative BDAT standards. The three technologies are: Wet air oxidation followed by carbon absorption; Chemical oxidation followed by carbon absorption; and Incineration of wastewaters. While we do not object to the three technologies, we believe that the use of carbon absorption to remove halogenated organics from wastewaters is demonstrated technology and were surprised that the Agency did not include this technology for the treatment of halogenated wastewaters. If the generator can attain the concentration-based treatment standards using only carbon absorption, then he should be allowed to utilize this technology and be spared the cost of installing unnecessary wet air oxidation or chemical oxidation systems upstream of the carbon absorption unit.

Comment Number: 46-Gv-1

Docket Number: LD12 - 00128

Commenter: Vulcan Materials Company

Issue: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur, and Organo-Nitrogen Compound Wastes

Subissue: Miscellaneous Halogenateds

Response:

The commenter opposes the combined use of carbon adsorption with chemical or wet air oxidation as the BDAT treatment standard for unquantifiable halogenated U and P wastewaters. The commenter argues that carbon adsorption is a treatment technology which, independently, can effectively treat these wastes.

The Agency believes that the best technologies for treating unquantifiable organic constituents in U and P wastewaters are those technologies that completely destroy the U and P constituents, such as incineration, chemical oxidation, and wet air oxidation. Carbon adsorption is a technology which removes organics from wastewater streams; however, the waste constituents are not destroyed but rather transferred to a more concentrated waste, eg. the carbon bed. This waste would require further treatment of organic constituents prior to land disposal. As a result, the Agency does not consider carbon adsorption (used by itself) to be the best technology for treating unquantifiable organic constituents in U and P wastewaters.

This does not necessarily preclude carbon adsorption from being considered part of a BDAT treatment train. The Agency has determined that chemical oxidation and wet air oxidation provide substantial treatment of unquantifiable organic constituents in U and P wastewaters; however, since these constituents are unquantifiable, and therefore it is not possible to accurately judge the effectiveness of wet air oxidation and chemical oxidation, these destruction technologies alone may not completely treat the organics in the U and P wastewaters. EPA believes, therefore, that it is sound engineering judgment to include a final step of carbon adsorption following oxidation. This will ensure that remaining organic constituents are removed from the wastewater matrix. Additionally, spent carbon from treating these wastewaters becomes a nonwastewater form of this waste (54 Federal Register 26630-1, June 23, 1989) and thus must be incinerated. EPA believes that incineration is the most successful method of treatment for a wide variety of organic wastes, and therefore is including carbon adsorption in the oxidation treatment train to ensure ultimate destruction of the organic constituents present in the U and P wastewaters.

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Comment Number: 46-Gui-1

Docket Number: LD12-00185

Commenter: Shell Oil Company

Issue: ISSUE CODE 46: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: Miscellaneous Halogenateds

Comment:

Treatment of Waste Associated Wastewaters In Conventional Wastewater Treatment Systems

The option to route dilute wastewaters from waste related activities to biotreatment in conventional wastewater systems should be allowed. Waters such as incinerator scrubber waters, contaminated groundwaters and multi-source leachate will likely be readily treatable to meet NPDES discharge limits set for those facilities. The process related constituents treated in the NPDES systems will be identical or similar to those found in the waste associated waters mentioned.

Attachment II expands on the discussion of this option and we encourage the Agency to consider this opportunity and reduce the administrative and regulatory burden associated with requiring the wastewater to carry the LDRs for the waste from which it was generated.

We recommend that the biodegradation potential at existing NPDES systems be made available for handling appropriate dilute wastewaters without the RCRA burdens being applied to those existing systems already handling the same or similar constituents.

cont

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Comment Number: 46-Gvi-1 (Continued)

Docket Number: LD12-00185

Commenter: Shell Oil Company

Issue: ISSUE CODE 46: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: Miscellaneous Halogenateds

Comment:

ATTACHMENT II

COMMENTS ON THE APPROPRIATENESS OF TREATING WASTEWATERS DERIVED FROM HALOGENATED HAZARDOUS WASTES IN CONVENTIONAL WASTEWATER TREATMENT SYSTEMS

In the proposed rules for land disposal restrictions of hazardous wastes, EPA not only proposes numerical standards for these solid wastes but also specifies treatment technologies for wastewaters derived from hazardous waste treatment units; i.e., scrubber water from incinerators and multi-source leachate. The proposed rule is specially stringent for wastewater containing halogenated organics; some of the designed U and P wastes. The Agency proposes three treatment technologies as alternative BDAT standards instead of numerical discharge limitations for various compounds. The technologies proposed are:

1. Wet Air Oxidation followed by Carbon Adsorption
2. Chemical Oxidation followed by Carbon Adsorption
3. Incineration of Wastewaters

Biodegradation has not been proposed, although it is not precluded from use as part of the treatment process. EPA is soliciting comments and data on this subject.

This attachment provide technical arguments on the inappropriateness of specifying generic treatment technology for specific wastewater without further waste characterization. Secondly, some biodegradation data on halogenated organics are provided to support the Shell position that using a conventional biotreater is the preferred disposal route for these wastewaters.

Treatment of Wastewater Containing Halogenated Organics

It is technically impossible to specify a generic treatment system for a wastewater stream without knowing its characteristics such as the types and concentration of the halogenated organics, the concentration of other organics and its inorganic salt contents. The current EPA approach presents a concern of leading to misapplication of technologies. This concern is demonstrated by commenting on limitations of the three treatment alternatives specified by EPA.

1. Wet Air Oxidation followed by Carbon Adsorption

   Wet air oxidation (WAO) is ordinarily used in treating concentrated organic wastes. In order to sustain self combustion, a wastewater COD concentration should be higher than 5,000 to 10,000 mg/l. For dilute waste, WAO is not applicable. Furthermore, the end products of WAO are short-chain carboxylic acids (mostly acetate), the followed activated carbon treatment specified by the EPA would not be

cont.

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Comment Number: 46-Gvi-1 (Continued)

Docket Number: LD12-00185

Commenter: Shell Oil Company

Issue: ISSUE CODE 46: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: Miscellaneous Halogenateds

Comment:

effective for the removal of these acids. Additional biological treatment would be required prior to discharge.

Some of the chlorinated compounds, such a methyl chlorides and chloroform, are not effectively removed by carbon adsorption. We do not agree that this treatment sequence is a viable alternative for most wastewater containing halogenated organics.

2. Chemical Oxidation followed by Carbon Adsorption

   Chemical oxidation, using ozone or hydrogen peroxide, alone is not effective for the reduction of most halogenated organics. UV light is also needed to generate the powerful free radicals from these oxidants. It is our experience that this technology becomes very expensive when the total organic concentration (not only halogenates) reaches above 10 ppm in the wastewater. Other inorganic salts such as carbonate ions are free radical scavengers. Their presence may render the chemical oxidation totally ineffective.

3. Incineration of Wastewaters

   Incineration of dilute wastewater is a very energy inefficient and a costly operation. In addition, the salt resulting from the water evaporation presents corrosion and clogging problems. From our experience we do not believe this is a feasible alternative for dilute wastewater.

4. General Comments

   Every wastewater treatment process has its own application niche. The selection of an appropriate treatment train should be tailored to specific conditions. One cannot accomplish the goal of pollution control by specifying a-prior generic treatment technologies for such a diversified class of wastewater as leachate streams from hazardous waste treatment operations. Thus we recommend that dilute wastewaters that are biodegradable are far more amenable to biotreatment than to any of the alternatives the Agency has proposed.

cont.

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Comment Number: 46-Gvi-1 (Continued)

Docket Number: LD12-00185

Commenter: Shell Oil Company

Issue: ISSUE CODE 46: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: Miscellaneous Halogenateds

Comment:

Biodegradation Data for Halogenated Organics

Large number of halogenated organics are amenable to biotreatment. For some of them, biodegradation is the only alternative for their reduction. Significant amount of work has been done in the area of biodegradation of halogenated organics, either in the context of basic biological science and applied environmental control engineering. The following articles are summary papers in dealing with biotreatment of priority pollutants. They are but a very small portion of what is available in the open literature.

1. Peterson, J. W. and P. S. Kodukala, "Biodegradation of Hazardous Organic Pollutants", CEP, April, 1981, P. 49.
2. Richards, D. J. and W. K. Shieh, "Review Paper - Biological Fate of Organic Priority Pollutants in the Aquatic Environment", Water Research, Vol. 20, No. 9, 1986, P. 1077.
3. Lawson, C. T. and S. A. Stegriest, "Removal Mechanisms for Selected Priority Pollutants in Activated Sludge System", Proc. Environ. Engrg. Conf., American Society of Civil Engineering, Atlanta, Ga., 1981.
4. Tabak, H. H., S. A. Quave, C. I. Mashni and E. F. Barth, "Biodegradability Studies with Organic Priority Pollutant Compounds", Jour. of Water Pollution Control Federation Octo., 1981, P. 1503.

cont.

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Comment Number: 46-Gvi-1 (Continued)

Docket Number: LD12-00185

Commenter: Shell Oil Company

Issue: ISSUE CODE 46: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: Miscellaneous Halogenateds

Comment:

Treatment of These Derived Wastewaters in a Conventional NPDES Facility

For the petrochemical industries, most of the new hazardous waste treatment facilities will likely be located within production plants which are served by NPDES permitted wastewater treatment plants. The derived wastewaters are usually low contamination, low volume streams. In addition, these wastewater treatment systems are most likely designed to deal with the organics concerned.

To conserve resources and simplified treatment operations, whenever possible, combined treatment of these derived wastewater streams in a compatible NPDES facility should be encouraged and provided for in land disposal restrictions program without the burden of further permitting requirements under RCRA.

Comment Number: 46-Gvi-1

Docket Number: LD12 - 00185

Commenter: Shell Oil Company

Issue: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur, and Organo-Nitrogen Compound Wastes

Subissue: Miscellaneous Halogenateds

Response: The commenter recommends that the option to route dilute unquantifiable U and P wastewaters to biological treatment units in conventional wastewater systems should be allowed.

The Agency disagrees. Biological treatment is not being promulgated as a technology-based BDAT treatment standard for unquantifiable organic U and P wastewaters, because concentrations of these wastes in the influent to the biological treatment unit cannot be measured. Therefore, the treatment unit operators cannot control the levels of these wastes reaching the working organisms in the biological treatment unit. The risk of sending unmeasurable quantities of these wastes to a biological treatment unit includes the possibility of shock loads that would disable the plant's working organisms. This would allow these and other wastes to exit untreated in the effluent until the biological treatment system could be restored to working order.

The Agency believes that the best technologies for treating unquantifiable U and P wastewaters are those technologies that completely destroy the regulated constituents in U and P wastes, such as incineration, chemical oxidation, and wet air oxidation. As a result, the Agency does not consider carbon adsorption (used by itself), a removal technology, to be the best technology for treating unquantifiable U and P wastewaters.

This does not necessarily preclude carbon adsorption from being considered part of a BDAT treatment train. The Agency has determined that chemical oxidation and wet air oxidation provide substantial treatment of unquantifiable organic constituents in U and P wastewaters; however, since these constituents are unquantifiable, and therefore it is not possible to accurately judge the effectiveness of wet air oxidation and chemical oxidation, these destruction technologies alone may not completely treat the regulated organics in U and P wastes. EPA believes, therefore, that it is sound engineering judgment to include a final step of carbon adsorption following oxidation. This will ensure that remaining organic constituents are removed from the wastewater matrix. The Agency believes that carbon adsorption is the most appropriate removal technology for the widest range of organic compounds likely to be present in the oxidation effluent stream.

Additionally, spent carbon from treating these wastewaters becomes a nonwastewater form of this waste (54 Federal Register 26630-1, June 23, 1989) and thus must be incinerated. EPA believes that incineration is the most successful method of treatment for a wide variety of organic wastes, and therefore is including carbon adsorption in the oxidation treatment train to ensure ultimate destruction of the regulated constituents present in the U and P wastewaters.

Finally, the commenter should note that industrial wastewaters that are subject to the Clean Water Act and are hazardous under RCRA are subject to RCRA Subtitle C hazardous waste management regulations prior to discharge. (However, a wastewater treatment unit as defined in 40 CFR 260.10 need not be permitted.) The land disposal restrictions would only apply to such wastes if and when land disposal, as defined in 40 CFR 268.2, occurs. Absent placement in or on the land, the treatment standards would not apply.

Comment Number: 46-Gvii-1

Docket Number: LD12-L0023

Commenter: Racon Inc.

Issue: ISSUE CODE 46: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: Miscellaneous Halogenateds

Comment:

Dichlorodifluoromethane and trichlorofluoromethane should not be regulated under RCRA as U listed wastes. These compounds are not hazardous and were included under RCRA due to their ozone depletion potential. It is our understanding that carbon tetrachloride destruction is used as the monitoring compound for conducting trial burns for regulated incinerators. Considering that dichlorodifluoromethane and trichlorofluoromethane are more difficult to incinerate than carbon tetrachloride there would be no incinerators permitted to burn these materials without permit modification by EPA. It appears this in and of itself would create a shortage of treatment capacity.

Comment Number: 46-Gvii-1

Docket Number: LD12 - L0023

Commenter: Racon Inc.

Issue: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur, and Organo-Nitrogen Compound Wastes

Subissue: Miscellaneous Halogenateds

Response:

The Agency is mandated by Congress to regulate all wastes listed under RCRA. U075 and U121 were listed as hazardous wastes in 1980 and the Agency is not accepting comments during this rulemaking on the appropriateness of the 1980 hazardous waste listings. Concentration-based treatment standards are being promulgated for wastewater and nonwastewater forms of both dichlorodifluoromethane (U075) and trichloromonofluoromethane (U121). The Agency has data showing adequate treatment by incineration of dichlorodifluoromethane to levels below detection limits. The Agency believes that based on structural similarities, trichloromonofluoromethane will also be treated to similar levels by incineration. The commenter should note, however, that any technology can be used for treatment of these U wastes provided that the treated waste achieves compliance with the applicable treatment standards.

In addition, a national capacity variance covering these waste codes is being issued so that the effective date of the treatment standards is being delayed for three months. If good faith efforts made to locate an available treatment facility nationwide are unsuccessful, a petition for a case by case extension can be made. However, such an petition should be submitted early because after the effective date, facilities must comply with applicable treatment standards pending EPA's determination on the petition.

Comment Number: 46-Gviii-1

Docket Number: LD12-00168

Commenter: American Petroleum Institute

Issue: ISSUE CODE 46: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: Miscellaneous Halogenateds

Comment:

III. A.2.a.(2) - Proposed Treatment Standards for Halogenated Organic Wastes; Specifying Incineration for Halogenated Nonwastewaters

EPA notes that where it is imposing incineration as a method of treatment for halogenated organic wastes it is not including "fuel substitution" as an alternative. If the standard is concentration based, however, then thermal destruction in a fuel substitution unit is allowed. 54 Fed. Reg. 48393.

API suggests that the standard for treating halogenated organic wastes should be revised to allow fuel substitution. These wastes have fuel value, and there is no environmental reason not to make use of it.

Comment Number: 46-Gviii-1

Docket Number: LD12 - 00168

Commenter: **American Petroleum Institute**

Issue: **Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes**

Subissue: **Miscellaneous Halogenateds**

Response:

The commenter suggests that fuel substitution be allowed as an alternative BDAT method of treatment for miscellaneous halogenated U and P wastes.

The Agency is promulgating fuel substitution, along with incineration, as the BDAT treatment standard as a method of treatment for certain unquantifiable U and P nonwastewaters, but not for halogenated U and P nonwastewaters. In general, the Agency is promulgating fuel substitution as a BDAT treatment standard for any unquantifiable U and P nonwastewater that contains only carbon, hydrogen, and/or oxygen in its chemical structure.

The Agency is basing this change in treatment options from the proposed rule on numerous comments received recommending the inclusion of fuel substitution in the final rule. Commenters noted that many organic U and P wastes have significant energy recovery value, which would be lost if incinerated. The Agency agrees to allow fuel substitution as a treatment method for wastes not amenable to quantification which contain only carbon, hydrogen, and/or oxygen, but not halogens, sulfur, or nitrogen, in their molecular structure. Eliminating halogen-, sulfur-, and nitrogen-containing wastes from use in fuel substitution units removes the potential for unregulated SOx, NOx, or halogens to be emitted from boilers or other thermal combustion facilities not yet regulated as treatment units under 40 CFR 264.

EPA believes that wastes without halogens, sulfur, or nitrogen can be treated by fuel substitution as well as by incineration because the aromatic and aliphatic (both saturated and unsaturated) components of these wastes are typically used as fuel due to their high heating value.

Comment Number: 46-Gviii-2

Docket Number: LD12-00190

Commenter: Union Carbide

Issue: ISSUE CODE 46: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: Miscellaneous Halogenateds

Comment:

Fuel Substitution Should be an Allowable Treatment Technology for Halogenated Organic Wastes - UCC believes that the Agency should allow fuel substitution as an acceptable treatment alternative for halogenated organic wastes. Chloride emissions from these streams will be controlled by the recently proposed rule for burning hazardous wastes in boilers and industrial furnaces. Many of these streams have an excellent fuel value and, with the boiler rules, the burning of these wastes will be done in a manner that is protective of human health and the environment. Also, elimination of this technology as an acceptable method will again add a significant burden to an already scarce commodity-incineration capacity.

Comment Number: 46-Gviii-2

Docket Number: LD12 - 00190

Commenter: Union Carbide

Issue: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: Miscellaneous Halogenateds

Response:

The commenter suggests that fuel substitution be allowed as an alternative BDAT method of treatment for halogenated U and P wastes.

The Agency is promulgating fuel substitution, along with incineration, as the BDAT treatment standard as a method of treatment for certain unquantifiable U and P nonwastewaters, but not for halogenated U and P nonwastewaters. In general, the Agency is promulgating fuel substitution as a BDAT treatment standard for any unquantifiable U and P nonwastewater that contains only carbon, hydrogen, and/or oxygen in its chemical structure.

The Agency is basing this change in treatment options from the proposed rule on numerous comments received recommending the inclusion of fuel substitution in the final rule. Commenters noted that many organic U and P wastes have significant energy recovery value, which would be lost if incinerated. The Agency agrees to allow fuel substitution as a treatment method for wastes not amenable to quantification which contain only carbon, hydrogen, and/or oxygen, but not halogens, sulfur, or nitrogen, in their molecular structure. Eliminating halogen-, sulfur-, and nitrogen-containing wastes from use in fuel substitution units removes the potential for unregulated SOx, NOx, or halogens to be emitted from boilers or other thermal combustion facilities not yet regulated as treatment units under 40 CFR 264.

EPA believes that wastes without halogens, sulfur, or nitrogen can be treated by fuel substitution as well as by incineration because the aromatic and aliphatic (both saturated and unsaturated) components of these wastes are typically used as fuel due to their high heating value.

Comment Number: 46-Gviii-3

Docket Number: LD12-00242

Commenter: Merck & Co. Inc.

Issue: ISSUE CODE 46: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: Miscellaneous Halogenateds

Comment:

Another area of concern for Merck is the availability of fuels blending number of compounds with treatment standards of incineration or fuels substitution specified is limited. There are several compounds, U055-Cumene, U056-Cyclohexane, and U186-1,3-Pentadiene which only have incineration specified without opportunity for fuels blending. Because these hazardous wastes were listed for ignitability EPA's concern about toxicity and acid gas formation from burning as fuels would not apply. Furthermore, some of these compounds are degradation products from other compounds that are known to more toxic (e.g., benzene, toluene, and xylene) and have numerical treatment standards based on incineration and which are eligible for fuels blending, It should also be noted that boilers and industrial furnaces typically have higher operating temperatures and therefore better destruction than incinerators. We would suggest that at a minimum the treatment standard for U055, U056 and U186 have a treatment standard of incineration or fuels substitution and would further suggest that all U-listed compounds which are listed for ignitability only and the standard is expressed as a method of treatment, have treatment standards of incineration or fuels substitution.

We also feel that the Agency is being overly restrictive in specifying incineration only for halogenated non-wastewaters. We feel that BDAT for HOCs should be incineration or fuels substitution. We can understand the Agency's concern about the toxicity of the pesticides and other halogenated organics listed for toxicity however we feel that the need for control of HCl emissions from the destruction of halogenated organics not listed for toxicity is not a valid argument. Currently, boilers and industrial furnaces have an emission rate limitation or a required control efficiency in their permits to receive the hazardous waste fuels. Furthermore, these limits are usually set by local air agencies taking into account acid gas formation. There is no reason to preclude feed of halogenated compounds within this limitation.

The supplemental notice to the proposed rule for boilers and industrial furnaces is proposing an approach for control of acid gases similar to that being used under the Omnibus authority for RCRA hazardous waste incinerators. This limitation established feed rate and emission rate limitations from health risk-based levels. We feel that the existing limitations are sufficiently protective of public health and the environment for control of acid gases and when the new regulations are promulgated in late 1990 they will be even more protective. Therefore, we feel that the Agency should allow fuels substitution for those halogenated non-wastewaters that are not listed for toxicity.

Comment Number: 46-Gviii-3

Docket Number: LD12 - 00242

Commenter: Merck & Co. Inc.

Issue: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: Miscellaneous Halogenateds

Response:

The commenter suggests that fuel substitution be allowed as an alternative BDAT method of treatment for halogenated U and P nonwastewaters.

The Agency is promulgating fuel substitution, along with incineration, as the BDAT treatment standard as a method of treatment for certain unquantifiable U and P nonwastewaters, but not for halogenated U and P nonwastewaters. In general, the Agency is promulgating fuel substitution as a BDAT treatment standard for any unquantifiable U and P nonwastewater that contains only carbon, hydrogen, and/or oxygen in its chemical structure.

The Agency is basing this change in treatment options from the proposed rule on numerous comments received recommending the inclusion of fuel substitution in the final rule. Commenters noted that many organic U and P wastes have significant energy recovery value, which would be lost if incinerated. The Agency agrees to allow fuel substitution as a treatment method for wastes not amenable to quantification which contain only carbon, hydrogen, and/or oxygen, but not halogens, sulfur, or nitrogen, in their molecular structure. Eliminating halogen-, sulfur-, and nitrogen-containing wastes from use in fuel substitution units removes the potential for unregulated SOx, NOx, or halogens to be emitted from boilers or other thermal combustion facilities not yet regulated as treatment units under 40 CFR 264.

EPA believes that wastes without halogens, sulfur, or nitrogen can be treated by fuel substitution as well as by incineration because the aromatic and aliphatic (both saturated and unsaturated) components of these wastes are typically used as fuel due to their high heating value.

Comment Number: 46-Gviii-4

Docket Number: LD12-00128

Commenter: Vulcan Chemicals

Issue: ISSUE CODE 46: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: Miscellaneous Halogenateds

Comment:

Proposed Treatment Standards for Halogenated Organic Wastes

Since many of the chemicals which are U and P listed wastes also fall within the general category of halogenated hydrocarbons, EPA is proposing to establish treatment standards for these halogenated chemicals by establishing six general categories of halogenated organics and to establish concentration-based treatment standards for each general category. Wastes containing more than 1000 ppm of the halogenated U and P chemicals would also qualify as California List HOC's and the BDAT for these HOC's is Incineration as a Method of Treatment, with Fuel Substitution as an alternative Method of Treatment. However, due to the potentially large quantity of off-specification or spilled U and P chemicals or the potentially high toxicity of some of the U and P chemicals. EPA is proposing that Incineration as a Method of Treatment also apply to the U and P halogenated organic chemicals but the alternative of fuel substitution not be allowed unless there is a concentration-based treatment standard for that particular chemical. Then, destruction in fuel substitution units would not be precluded.

Comment Number: 46-Gviii-4

Docket Number: LD12 - 00128

Commenter: Vulcan Chemicals

Issue: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: Miscellaneous Halogenateds

Response:

The commenter points out that fuel substitution is not allowed as an alternative BDAT method of treatment for halogenated U and P nonwastewaters, under the proposed rule.

The Agency is promulgating fuel substitution, along with incineration, as the BDAT treatment standard as a method of treatment for certain unquantifiable U and P nonwastewaters, but not for halogenated U and P nonwastewaters. In general, the Agency is promulgating fuel substitution as a BDAT treatment standard for any unquantifiable U and P nonwastewater that contains only carbon, hydrogen, and/or oxygen in its chemical structure.

The Agency is basing this change in treatment options from the proposed rule on numerous comments received recommending the inclusion of fuel substitution in the final rule. Commenters noted that many organic U and P wastes have significant energy recovery value, which would be lost if incinerated. The Agency agrees to allow fuel substitution as a treatment method for wastes not amenable to quantification which contain only carbon, hydrogen, and/or oxygen, but not halogens, sulfur, or nitrogen, in their molecular structure. Eliminating halogen-, sulfur-, and nitrogen-containing wastes from use in fuel substitution units removes the potential for unregulated SOx, NOx, or halogens to be emitted from boilers or other thermal combustion facilities not yet regulated as treatment units under 40 CFR 264.

EPA believes that wastes without halogens, sulfur, or nitrogen can be treated by fuel substitution as well as by incineration because the aromatic and aliphatic (both saturated and unsaturated) components of these wastes are typically used as fuel due to their high heating value.

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Comment Number: 46-Hi-1

Docket Number: LD12-00159

Commenter: WASTE MANAGEMENT, INC. and CHEMICAL WASTE MANAGEMENT, INC.

Issue: ISSUE CODE 46: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue Organosulfur Compounds

Comment

B. Organo-Sulfur/Organo-Nitrogen Ash Treatment Standards (Fed. Reg. at 48,414-17)

The Agency proposes concentration-based treatment standards at the analytical detection limit for a number of organic compounds in this section. This approach incorrectly assumes that incineration is capable of 100% destruction of a compound resulting in no analytical detection of such compound in the ash. WMI believes the Agency's reasoning is technically incorrect for the following reasons.

1. Establishing treatment standards based on a concentration level per unit of ash is arbitrary and does not accurately reflect the waste feeds to the incinerator. Further, such arbitrary standards may over or underestimate the actual performance of the incineration unit.

2. Commercial incineration units typically burn waste from more than one waste feed system simultaneously. As such, wastes having high and low ash contents are typically fed. Burning a waste with a high ash content along with an organo-sulfur or organo-nitrogen compound would result in a lower concentration of organic constituents in the ash. Conversely, a low ash waste feed would increase the concentration in the ash. The volume of ash determines the constituent concentration in the ash. Accordingly, a waste containing high ash content may be

cont.

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Comment Number: 46-Hi-1 (Continued)

Docket Number: LD12-00059

Commenter: WASTE MANAGEMENT, INC. and CHEMICAL WASTE MANAGEMENT, INC. (continued)

Issue: ISSUE CODE 46: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: Organosulfur Compounds

Comment:

construed as impermissible dilution of other low ash wastes that have numerical ash limitations.

3. The analytical detection limits vary depending upon a number of factors. For example, those compounds which are in wide use or for which there are environmental concerns may have well defined and lower analytical detection limits. For this reason, application of analytical detection limits is arbitrary. If it is assumed that a numerical limitation is required, then the limitation should be established based on incinerator performance criteria and then adjusted for analytical considerations.

The above comments also apply to the chemistry and quality of scrubber waters generated by incinerators. A broad variety of wet scrubbing devices are utilized and the volumes of water used by these devices and the design and operation for scrubber systems are variable. Therefore, it is impractical to confirm performance on a daily basis and any relevance to the proposed standards is probably coincidental.

Comment Number: 46-Hi-1

Docket Number: LD12 - 00159

Commenter: Waste Management, Inc. and Chemical Waste Management, Inc.

Issue: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: Organosulfur Wastes

Response:

The commenter opposes the Agency's approach of setting concentration-based treatment standards at the analytical detection limit for organonitrogen wastes. The commenter contends that this approach is arbitrary and does not accurately reflect the waste feeds to the incinerator. The commenter also states that the volume of ash in the waste feed, as well as the performance of the particular incinerator, determines the constituent concentration in the ash. The commenter suggests that, if concentration-based treatment standards are deemed necessary by EPA, these standards should be established based on incineration performance criteria and then adjusted for analytical considerations. Finally, the commenter maintains that the design and operation of scrubber systems is variable and that any relevance to proposed wastewater standards is probably coincidental.

EPA prefers to establish concentration-based BDAT treatment standards whenever possible, ie. when characterization and treatability data is available for the waste constituent of interest. By setting concentration-based standards, the regulated community has the option of meeting the treatment standard for their waste(s) either by using the technology identified as BDAT, or by using another treatment method that can meet the standards. Promulgated treatment standards reflect the best treatment achievable by demonstrated and available technologies. The best technologies usually are capable of treating wastes to analytical detection limits, as determined during EPA treatment tests. This is particularly true for destruction technologies such as incineration. As a result, most standards are based on analytical detection limits.

EPA believes that basing concentration-based standards on incinerator performance results is not arbitrary, because these results are documented proof of the incinerator reaching a certain level of performance. Furthermore, these results were converted to concentration-based standards by a methodology accounting for process and analytical detection limit variability. This methodology is set up such that all concentration-based treatment standards lie above the actual incinerator performance results. Incineration is a BDAT treatment technology specified for a large number of the BDAT program regulated wastes. Incineration data used in the development of BDAT treatment standards for U & P wastes were obtained from 14 incineration tests conducted at not one but five different incinerators, with very few waste constituents being detected in the ash or scrubber water. These treatment tests were conducted using a variety of U and P waste-containing matrices, in order to account for different potential waste feeds. A concentration-based treatment standard for an analyzable organo-nitrogen constituent in U and P nonwastewaters was developed from the highest ash detection limit obtained from the 14 tests, unless the constituent was detected in a particular test or tests, in which case the highest ash detection limit from those tests was used. In calculating treatment standards, the selected detection limits were multiplied by correction factors to account for matrix and analytical variabilities. As a result, well-designed and operated incinerators should have no trouble attaining the numerical treatment standards.

If there is no EPA-approved SW-846 analytical method for a particular constituent, or if the analytical method for a particular constituent is so difficult as to cast doubt upon data obtained, then the Agency typically sets the BDAT treatment standard as a method of treatment. EPA proposed a method of treatment as the BDAT treatment standard for all eighteen of the organosulfur wastes, due to analytical difficulties associated with those wastes.

EPA is promulgating incineration as a method of treatment as the BDAT treatment standard for nonanalyzable U and P nonwastewater and wastewater constituents. The wastes must be treated by incineration, but EPA is not requiring any particular ash concentration of BDAT List constituents be reached.

Comment Number: 46-Hii-1

Docket Number: LD12-00179

Commenter: THE DOW CHEMICAL COMPANY

Issue: ISSUE CODE 46: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: Organosulfur Compounds

Comment:

XX. EPA SHOULD NOT, UNDER THE LAND DISPOSAL RESTRICTIONS PROGRAM, IMPOSE DETAILED OPERATIONAL REQUIREMENTS ON HAZARDOUS WASTE INCINERATORS.

54 Fed. Reg. 48,403, 48,417, 48,501

In the preamble to the Third Third proposal, EPA has expressed several concerns about air emissions that may result from treatment of wastes using technologies that have been identified as BDAT. See, e.g., 54 Fed. Reg. 48,501. In particular, the Agency has expressed concern "whether incineration of brominated organics or organo-nitrogen compounds may adversely affect air quality." 54 Fed. Reg. 48,502. Dow believes that these concerns, to the extent they are valid, are best addressed in the context of the Clean Air Act regulatory program or other aspects of the RCRA program.

EPA asserts that incineration of brominated organics may lead to "the release of toxic bromine gas." 54 Fed. Reg. 48,403. In order to avoid this perceived problem, the Agency has proposed a number of alternative control strategies, including requiring the addition sulfur whenever brominated compounds are burned and limiting the amount of bromine that can be burned in an incinerator. Id. These approaches, however, pose substantial implementation problems because, as EPA recognized, "different incinerators have different designs" that may warrant different controls. Id. Moreover, addition of sulfur may create new environmental problems such as the release into the air of sulfur dioxide. Dow believes that EPA's concerns can be better addressed through mechanisms other than the land disposal restrictions program.

EPA also expresses concern about the potential nitrogen and sulfur emissions generated from the incineration of organosulfur compounds. According to the Agency, "[t]he formation of nitrogen or sulfur oxides in the process of incinerating any of these compounds may require additional controls in order to meet air quality requirements pursuant to Section 108, 110 and 111 of the Clean Air Act or New Source Review under the CAA's Prevention of Significant Deterioration program." 54 Fed. Reg. 48,417. Given the fact that nitrogen and sulfur oxides are currently regulated under the Clean Air Act, Dow sees no reason why these concerns cannot be addressed under that statute. Indeed, Dow believes that EPA is obliged to use its authority under the Clean Air Act rather than its authority under RCRA Subtitle C. RCRA section 1006(b) explicitly directs EPA to "avoid duplication, to the maximum extent practicable, with the appropriate provisions of the Clean Air Act."

Comment Number: 46-Hii-1

Docket Number: LD12 - 00179

Commenter: **The Dow Chemical Company**

Issue: **Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes**

Subissue: **Organosulfur Wastes**

Response:

The commenter believes that air emission concerns associated with the incineration of organosulfur compounds are best addressed in the under the Clean Air Act regulatory program, or in aspects of the RCRA program other than the land disposal restrictions regulations.

The Agency agrees with the commenter, and is leaving responsibility for air quality at hazardous waste treatment facilities to the RCRA permitting process under 40 CFR 264 and 270.

The proposed rule solicited comment on several air emissions-related technical problems and regulatory issues anticipated to complicate the incineration of organonitrogen wastes. The issues all arise from the corrosive behavior of oxidized sulfur compounds, some of which are regulated under the Clean Air Act. EPA received no data characterizing SOx emissions or emissions control systems.

The RCRA permitting procedure requires Regional or State approval of the entire incinerator system, including process feed and air emissions control units. Additionally, SOx emissions are specifically limited by Clean Air Act stationary source permit requirements. Since both of these permits are issued on an individual facility basis, allowing individualized process controls, and since EPA lacks adequate data to dictate realistic SOx control system design, EPA agrees with this commenter and chooses not to mandate air emissions control for organonitrogen incineration systems. Permit-by-permit determinations under the RCRA omnibus authority may be the most appropriate air emissions control regulation for facilities burning these wastes. RCRA Section 3005(c)(3) states that "each permit issued under this section shall contain such terms and conditions as the Administrator (or the State) determines necessary to protect human health and the environment." EPA intends to provide guidance to permit writers with respect to facilities burning these wastes.

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Comment Number: 46-Hiii-1

Docket Number: LD12-00056, 56.A, 56.B, 56.C

Commenter: Exxon Chemical Company

Issue:

ISSUE CODE 46: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue:

Comment: Organosulfur Compounds

See the following

LD12-00056 2/18

EXXON CHEMICAL COMPANY

EXXON
CHEMICAL

Lisa
Laura

December 19, 1989

Capacity – New Technology

EPA RCRA DOCKET (OS-305)

U.S. Environmental Protection Agency
401 "M" Street S.W.
Washington, D.C. 200460

Re: Docket F-89-LD12-FFFF

Dear Sirs:

The attachment to this letter contains data prepared by Exxon Chemical Company and Rio Linda Chemical Company on a chlorine dioxide treatment method for reactive sulfides. It responds to the specific requests for data at Sections III.A.3.g. and III.A.4.d. of the "Third Third" proposal, 54 Fed. Reg. 48372 (Nov. 22, 1989). That data was prepared in accordance with all applicable analytical and QA/QC procedures. We believe that it shows that the treatment method in question is a strong contender for selection as BDAT for organo sulfur and reactive sulfide wastes.

The Exxon/Rio Linda test program has also validated a test method for measuring reactive sulfides.

We hereby request copies of any other data that may be submitted to this docket addressing the issue of BDAT for reactive sulfides. (Sections III.3.g. and III.A.4.d. of the proposal).

Please submit copies of this data to:

Mark McGlathery
Exxon Chemical Company
4510 E. Pacific Coast Highway
Long, Beach, Ca. 900804

We would be glad to answer any questions that EPA staff may have about this process, to submit additional data, including back-up data, and to meet with you personally to review this technology. Any inquiries and requests can be directed to:

Mark McGlathery
Exxon Chemical Company
4510 E. Pacific Coast Highway
Long Beach, Ca. 900804
(213) 597-8492

or

David W. Skodack
Exxon Chemical Co.
P.O. Box 4321
Houston, Tx. 772310-4321

P.O, Box 4321, Houston, Texas 77210-4321
Tel.: (713) 460-6800 Fax: (713) 460-6830
Telex: 4942225

A Division of Exxon Corporation

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Exxon Chemical Company
and
Rio Linda Chemical Company

D003 WASTES: REACTIVE SULFIDES

Data in Support of Chlorine Dioxide Oxidation as BDAT

I. Introduction

Exxon Chemical Company markets chemical oxidizers in the petrochemical industry to scavenge sulfidic material from process wastewater. These sulfidic materials include hydrogen sulfide gas entrained in water, simple inorganic sulfides, organic sulfides including complex mercaptans, and metal sulfides primarily as iron sulfide. When acidified, any of these compounds releases hydrogen sulfide gas.

A refinery in the Los Angeles area uses a chemical oxidation process developed by Exxon Chemical to remove reactive sulfide materials from process water before it is disposed into the Los Angeles County Sanitation District sewer system. Simple sulfides such as entrained hydrogen sulfide are easily scavenged from the water with hydrogen peroxide. Other sulfides, particularly organic sulfides and mercaptans, cannot be oxidized to sufficient levels using solely hydrogen peroxide to satisfy the Sanitation District. It has imposed a 1 ppm upper limit concentration for organic sulfides. The Sanitation District also prescribes a test method for determining organic sulfide concentration for all permit applicants known to discharge such materials.

Exxon Chemical Company uses a treatment process employing chlorine dioxide to scavenge organic sulfides from process wastewaters to meet the Sanitation District specification. The result of the treatment process is a single liquid discharge that meets all County Sanitation District pretreatment requirements.

The chlorine dioxide generation technology used by Exxon is unique. Patented by Rio Linda Chemical Co., it produces a chlorine-free effluent which eliminates formation of unwanted halogenated organic byproducts, processes large volumes of water, and is physically compact and easily transportable. Another unique feature of this patented technology is the formation of chlorine dioxide prior to contact with the eductor drive stream. The contaminated process stream drives the generation and chemical feed system, and no external fresh water feed is required. The resulting chemical feed system is inherently safe and prohibits direct contact of the chlorine dioxide precursor chemicals with the process stream. Other chlorine dioxide systems cannot make such claims.

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II. Treatment Schematic

Figure 1 is the treatment schematic of the chemical oxidation process at the Los Angeles refinery. Wastewater is transferred to a 5,000 barrel storage tank from crude distillation and gasoline, jet A-1, and diesel production units in the refinery. First, the water is circulated to mix the contents homogeneously. After circulation, oxidation treatment begins.

III. Treatment Process and Data Collection

The waste stream is pre-treated to remove simple sulfides solely for economic reasons. Typically the simple sulfides are removed from the wastewater by adding 50 percent hydrogen peroxide. Other options such as air stripping are available. The amount of hydrogen peroxide added is determined by the concentration of simple sulfides detected in the wastewater. Attachment 1 is a laboratory report showing simple sulfide levels over 500 mg/l in a recent wastewater stream. The peroxide is added by an eductor to insure proper mixing. Simple sulfides as hydrogen sulfide are monitored with lead acetate until complete oxidation to sulfates is completed. The organic sulfides are not reacted and remain in the wastewater. The water circulates back to the storage tank for retention.

Subsequently the water is treated with chlorine dioxide to remove complex sulfides. The amount of water treated is monitored with a turbine-type flow meter. Because of the dynamics of a Venturi-type eductor used to add the oxidant, the flow rate is constant for a given inlet fluid pressure. The amount of input chemicals (sodium chlorite, sodium hypochlorite, and hydrochloric acid) is controlled by rotometers. Since chlorine dioxide is not stable over time, it must be generated at the point of application via chemical reaction. The chemicals are aspirated together by the vacuum created by the throttling of the wastewater through the venturi. A schematic of the system is shown in Figure 2. A constant vacuum of 30 mm Hg allows for precise addition of chemical feed components. Flow and feed rate data are recorded to determine the amount of chlorine dioxide added, and the concentration of chlorine dioxide in the wastewater after treatment.

Samples are collected periodically in 16 ounce glass prescription bottles from points before and after chlorine dioxide addition. A new bottle is used every time to insure that the sample is not contaminated.

Laboratory analysis indicates that the reactive sulfide compounds are immediately scavenged from the wastewater upon addition of the chemical oxidizer. In this application, the

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TREATMENT SCHEMATIC

Oxidation of Reactive Sulfides

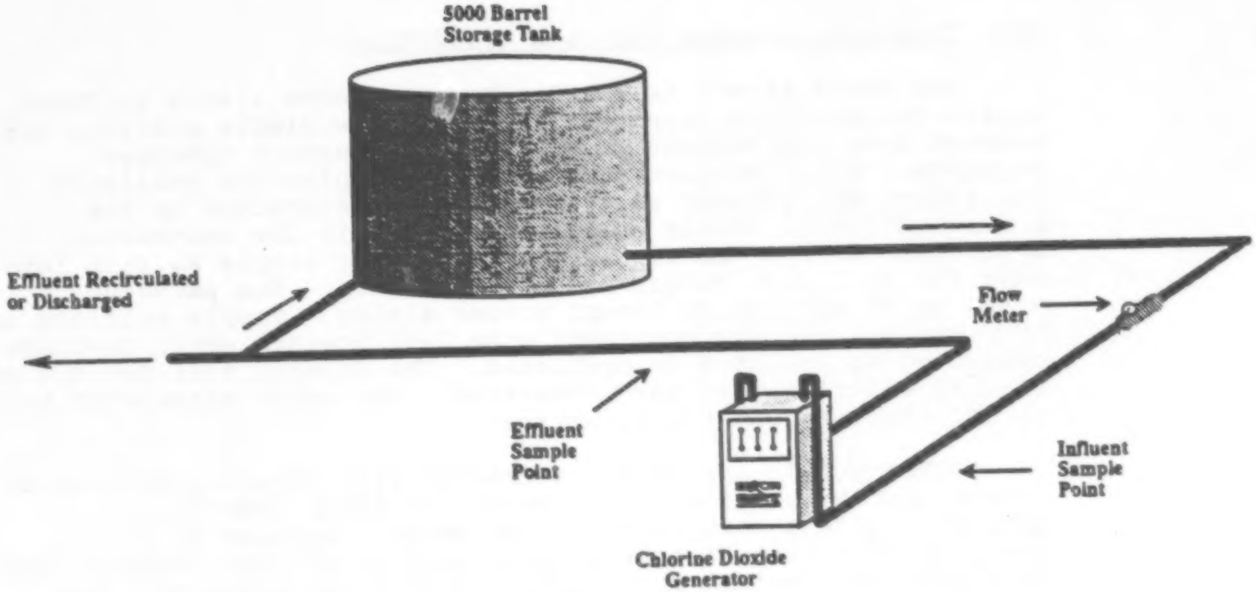
5000 Barrel
Storage Tank
Effluent Recirculated
or Discharged
Flow
Meter
Effluent
Sample
Point
Influent
Sample
Point
Chlorine Dioxide
Generator

Figure 1.

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CHLORINE DIOXIDE GENERATION PROCESS

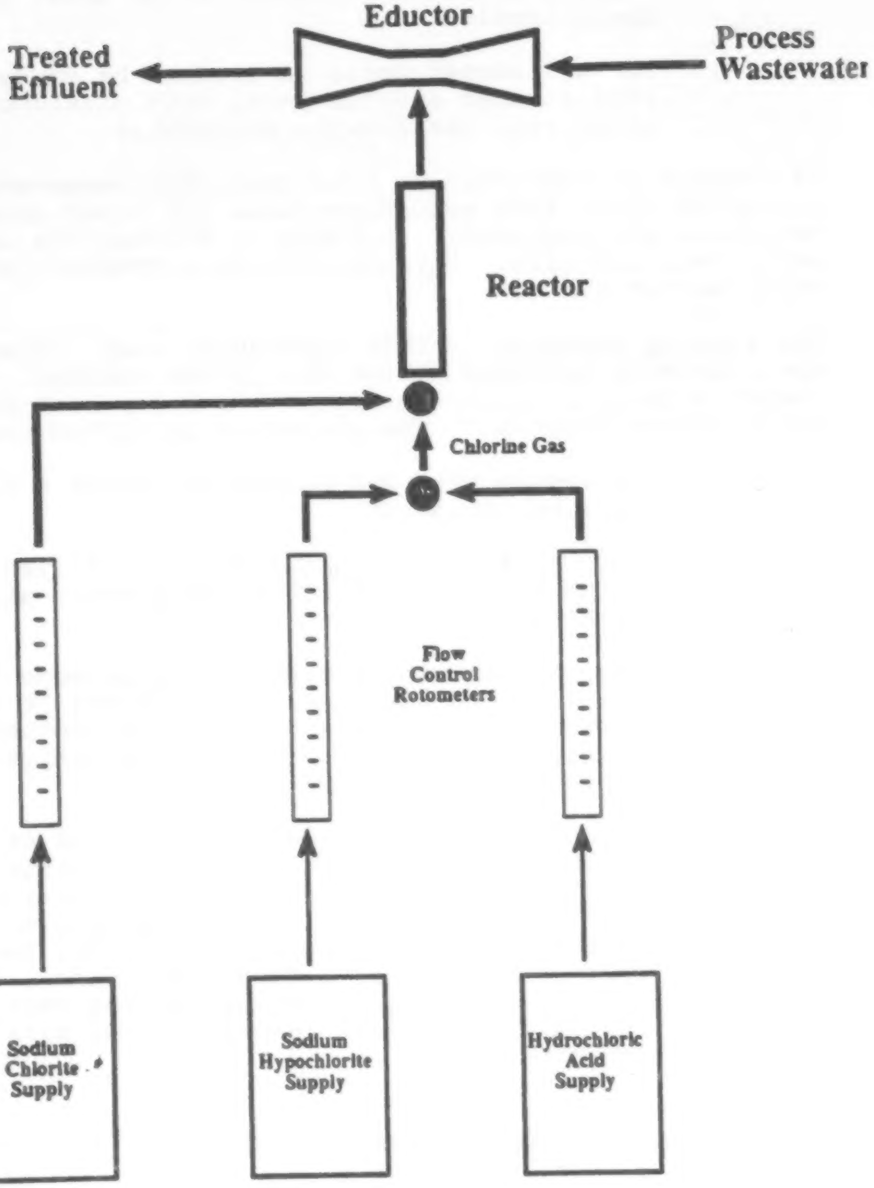
Eductor
Treated Effluent
Process Wastewater
Reactor
Chlorine Gas
Flow Control Rotometers
Sodium Chlorite Supply
Sodium Hypochlorite Supply
Hydrochloric Acid Supply

Figure 2

wastewater was treated by one of two methods, depending on the availability of storage tanks. Use of both methods demonstrates the versatility of the treatment regime.

1) The wastewater could be circulated, adding chlorine dioxide in the circulation loop, until the tank met specification.

2) The wastewater could be treated by emptying one tank into another storage tank, with chlorine dioxide being added into the flowing wastewater.

If tankage is available to hold processed wastewater, method 2 is preferred since less processing time and fewer chemical input materials are required. In Table 1, Batches 1-4 were processed using recirculation. Batches 5-10 were treated "straight-line" using method 2.

The samples reported in this submission were collected following the procedure outlined by the EPA in the document entitled "Generic Quality Assurance Project Plan for Land Disposal Restrictions Program." The procedure is listed below.

1) The sample port was purged to insure a flowing sample could be collected.

2) A 16 ounce sample bottle was over-filled with wastewater and then capped to prevent air from entraining in the sample.

3) Both influent and effluent samples were taken at the same time and labelled to show where it was taken, the time of sampling, wastewater flow, concentration of chlorine dioxide applied, and the analytical test the laboratory was to perform.

4) The organic sulfide analysis was done at the refinery's laboratory under County Sanitation District's supervision. Custody of the sample was accepted by the laboratory technician, logged in, and the analysis was performed. Results were given to the Exxon Chemical representative, key refinery personnel, and the County Sanitation District. A copy of the results remains on file at the refinery laboratory and will be retained for three years.

IV. Test Methodology and Test Precision

A copy of the Los Angeles County Sanitation District test procedure is included in this submittal as Appendix 1. The organo-sulfur compounds are complexed to form a red color

BDAT Organic Sulfide Data

Batch #	Date	Time of Sampling Hrs.	Gallons/Batch in thousands of gallons	Gallons/Min.	Cl02 Chemical Use lbs./ min.	Influent Concentration mg/l	Effluent Concentration mg/l	Standard Concentration Spiked Value mg/l	Standard Concentration Measured Value mg/l	Recovery Value
1	21-Dec-88	0900	134.4	200	1.67	35.50	0.00	1.00	0.98	98%
		1000		200	1.67	23.60	0.00	1.00	0.98	98%
		1200		200	1.67	12.20	0.00	1.00	0.98	98%
		1400		200	1.67	8.40	0.00	1.00	0.98	98%
2	12-Apr-89	0800	138.6	200	1.67	35.20	0.00	1.00	1.05	105%
		1000		200	1.67	21.40	0.00	1.00	1.05	105%
		1200		200	1.67	16.60	0.00	1.00	1.05	105%
		1400		200	1.67	5.60	0.00	1.00	1.05	105%
3	18-May-89	0900	126.0	200	2.08	22.80	0.00	1.00	1.00	100%
		1100		200	2.08	10.40	0.00	1.00	1.00	100%
		1400		200	2.08	5.40	0.00	1.00	1.00	100%
4	14-Jul-89	0900	130.2	200	1.67	15.60	0.00	1.00	1.02	102%
		1000		200	1.67	9.30	0.00	1.00	1.02	102%
		1300		200	2.08	6.40	0.00	1.00	1.02	102%
		1500		200	2.08	3.20	0.00	1.00	1.02	102%
5	18-Jul-89	1000	142.8	200	1.25	17.64	0.00	1.00	0.98	98%
		1000		200	1.67	17.64	0.00	1.00	0.98	98%
		1000		200	2.08	17.64	0.00	1.00	0.98	98%
		1000		200	2.50	17.64	0.00	1.00	0.98	98%
6	25-Jul-89	0900	113.4	210	1.67	13.56	0.10	1.00	1.01	101%
		1400		210	1.67	13.56	0.23	1.00	1.01	101%
	27-Jul-89	1000		200	1.67	8.33	0.10	1.00	1.01	101%
		1500		200	1.67	8.33	0.33	1.00	1.01	101%
7	22-Sep-89	1200	142.8	210	2.50	21.60	0.00	1.00	1.02	102%
		1300		210	2.50	21.60	0.00	1.00	1.02	102%
8	10-Oct-89	1100	136.5	200	1.45	22.16	0.00	1.00	1.00	100%
		1130		200	1.45	22.16	0.00	1.00	1.00	100%
		1000		200	1.45	22.16	0.00	1.00	1.00	100%
		1230		200	1.45	22.16	0.00	1.00	1.06	106%
9	9-Nov-89	1000	113.4	200	2.50	13.16	0.00	1.00	0.99	99%
		1200		200	2.50	12.97	0.00	1.00	0.99	99%
10	20-Nov-89	1000	134.4	200	2.92	12.58	0.75	1.00	0.99	99%
		1400		200	2.92	12.58	0.89	1.00	0.93	93%
			Total Number of Gallons Treated			Average Influent Concentration	Average Effluent Concentration			Average Recovery Value
			1312.5			16.03	0.072			100.48%

Table 1

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complex. The intensity of the color produced is proportional to the concentration of the organo-sulfur compounds expressed as sulfur. The procedure as written by the County claims precision and accuracy to be 90.3 percent from industrial wastewater matrices. In our data a standard sample was spiked with a 1 ppm lead mercaptide. The test was performed by the technician to determine the recovery of the 1 ppm standard. The average recovery value was 100.48 percent. The poorest recovery observed was 93 percent.

V. Results

Exxon Chemical began treating wastewater at this location in September of 1988. Approximately twenty five, 3500 barrel tanks have been treated at the time of this submittal. Table 1 shows the data collected following strict EPA QA/QC procedures over the past year on ten tanks of water treated. Only complex organic sulfide data is presented, since simple sulfides present in the wastewater were oxidized using hydrogen peroxide. The data covers Exxon Chemical Company's treatment of over a million gallons of wastewater with an average influent organic sulfide concentration of approximately 16 ppm. Most of these organic sulfides are mercaptan molecules which are the most difficult sulfidic materials to oxidize. The average effluent concentration of these species was 0.07 ppm. The average percentage reduction was 99.55 percent.

A representative volatile organic GCMS analysis of the treated wastewater is attached as Appendix 2 to show other compounds in the wastewater. The sample contains petroleum distillates characteristic of refinery wastewater. Chlorine dioxide does not react with these distillates to either oxidize solvents such as acetone, benzene, toluene, or xylene; or to chlorinate these volatile organic compounds.

VI. Statistical Analysis

The range on this method's limit of detection is given at 0.1 ppm organic sulfide. This value was inserted in all effluent concentrations less than 0.1 ppm in the effluent data table for statistical analysis. Statistical analysis as prescribed by the BDAT submittal documents is shown in Table 2. The C99 for the effluent data set is 0.36 ppm organic sulfides. This value is less than the 1.0 ppm standard set by the County. The data set has 33 samples taken over a year's period which indicates treatment is consistent over time.

Actual laboratory data and operating data are on file at the refinery. Copies of this data are available for inspection from Exxon Chemical Company upon request.

BDAT Data Statistical Analysis

Batch #	Time of Sampling hours	Influent Concentration mg/l	ln(Influent)	(ln(Influent))2	Effluent Concentration mg/l	ln(Effluent)	(ln(Effluent))2
					*		
1	0900		3.5695	12.7416	0.10	-2.3026	5.3019
	1000	23.60	3.1612	9.9935	0.10	-2.3026	5.3019
	1200		2.5014	6.2571	0.10	-2.3026	5.3019
	1400	8.40	2.1282	4.5294	0.10	-2.3026	5.3019
2	0800	35.20	3.5610	12.6810	0.10	-2.3026	5.3019
	1000	21.40	3.0634	9.3843	0.10	-2.3026	5.3019
	1200	16.60	2.8094	7.8927	0.10	-2.3026	5.3019
	1400	5.60	1.7228	2.9679	0.10	-2.3026	5.3019
3	0900	22.80	3.1268	9.7768	0.10	-2.3026	5.3019
	1100	10.40	2.3418	5.4840	0.10	-2.3026	5.3019
	1400	5.40	1.6864	2.8439	0.10	-2.3026	5.3019
4	0900	15.60	2.7473	7.5476	0.10	-2.3026	5.3019
	1000	9.30	2.2300	4.9730	0.10	-2.3026	5.3019
	1300	6.40	1.8563	3.4458	0.10	-2.3026	5.3019
	1500	3.20	1.1631	1.3529	0.10	-2.3026	5.3019
5	1000	17.64	2.8702	8.2380	0.10	-2.3026	5.3019
	1000	17.64	2.8702	8.2380	0.10	-2.3026	5.3019
	1000	17.64	2.8702	8.2380	0.10	-2.3026	5.3019
	1000	17.64	2.8702	8.2380	0.10	-2.3026	5.3019
6	0900	13.56	2.6071	6.7971	0.10	-2.3026	5.3019
	1400	13.56	2.6071	6.7971	0.23	-1.4697	2.1599
	1000	8.33	2.1199	4.4938	0.10	-2.3026	5.3028
	1500	8.33	2.1199	4.4938	0.33	-1.1087	1.2291
7	1200	21.60	3.0727	9.4414	0.10	-2.3026	5.3019
	1300	21.60	3.0727	9.4414	0.10	-2.3026	5.3019
8	1100	22.16	3.0983	9.5994	0.10	-2.3026	5.3019
	1130	22.16	3.0983	9.5994	0.10	-2.3026	5.3019
	1000	22.16	3.0983	9.5994	0.10	-2.3026	5.3019
	1230	22.16	3.0983	9.5994	0.10	-2.3026	5.3019
9	1000	13.16	2.5772	6.6419	0.10	-2.3026	5.3019
	1200	12.97	2.5626	6.5671	0.10	-2.3026	5.3019
10	1000	12.58	2.5321	6.4116	0.75	-0.2877	0.0828
	1400	12.58	2.5321	6.4116	0.89	-0.1165	0.0136

* Data corrected to reflect accuracy of test method.

Sum:		529.07	87.3460	240.7175	5.10	-69.768	167.2412
Sample Size:		33	33		33	33	
Mean:		16.03 -------	2.6468 ------	7.2945 ------	0.15 ------	-2.1139 -------	4.7649 ------
Std. Deviation		17.74	2.7008		0.2281	2.1828	
C99(efflt)	0.36						
Variability Factor(efflt)	2.40						

Table 2

B1/01

VII. Other Commercial Operations, Miscellaneous

Other commercial applications of this technology include but are not limited to the use of chlorine dioxide for the destruction of oxidizable organic and inorganic materials including sulfidic materials that plug oilfield water injection and production wells, and surface equipment; and destruction of cyanide in gold mining tailings effluent.

Because of experience gained in the application of this technology and a perceived need in the hazardous waste treating industry, Exxon Chemical Company/Rio Linda Chemical offered to demonstrate this technology to the EPA under the auspices of the Superfund Innovative Technology Evaluation (SITE) program. The offer was accepted and during the course of qualifying the technology for demonstration, John Martin of EPA (513 569-7758; FTS: 684-7758) viewed the equipment and technology in operation.

LD12-00056.A
Attachment 1
12/18

REPORT

TRUESDAIL LABORATORIES, INC.

CHEMISTS - MICROBIOLOGISTS - ENGINEERS
RESEARCH - DEVELOPMENT - TESTING

14201 FRANKLIN AVENUE
TUSTIN, CALIFORNIA 92680
AREA CODE 714 • 730-6239
AREA CODE 213 • 225-1564
CABLE: TRUELABS

CLIENT **Exxon Chemical Company**
5799 E. Pacific Coast Hwy, Suite 410
Long Beach, California 90804
Attention: Mara McGlathery

DATE December 19, 1989
RECEIVED November 17, 1989
LABORATORY NO. 35235

SAMPLE **Wastewaters**

INVESTIGATION **Sulfide Content (ASTM D-2385 Modified)**

RESULTS

	MILLIGRAMS PER LITER
Wastewater from tank 5006 untreated	541
Wastewater from tank 5006 treated	<0.5

Respectfully submitted,
TRUESDAIL LABORATORIES, INC.

Julia Nayberg

Julia Nayberg, Manager
Inorganic Chemistry

This report applies only to the sample, or samples, investigated and is not necessarily indicative of the quality or condition of apparently identical or similar products. As a mutual protection to clients, the public and these Laboratories, this report is submitted and accepted for the exclusive use of the client to whom it is addressed and upon the condition that it is not to be used, in whole or in part, in any advertising or publicity matter without prior written authorization from these Laboratories.

LD12-00056.B
Attachment 2
13/18

REPORT

TRUESDAIL LABORATORIES, INC.

CHEMISTS - MICROBIOLOGISTS - ENGINEERS
RESEARCH - DEVELOPMENT - TESTING

14201 FRANKLIN AVENUE
TUSTIN, CALIFORNIA 92680
AREA CODE 714 • 730-6239
AREA CODE 213 • 225-1564
CABLE: TRUELABS

CLIENT **Exxon**
4510 E. Pacific Coast Hwy.
Long Beach, CA 90805
Attention: Mark

DATE November 28, 1988

RECEIVED Nov. 18, 1988

LABORATORY NO. 31362

SAMPLE **Wastewater**

INVESTIGATION

624-(1)
625(2)

PURGEABLE ORGANICS (Volatiles) by EPA 624
GAS CHROMATOGRAPHY/MASS SPECTROMETRY

RESULTS

Constituent	Detection* Limit ug/l	Concentration** ug/l(ppb)
Acetone	5.0 ug/l	183,000
Benzene	5.0 ug/l	116
Bromodichloromethane	5.0 ug/l	ND
Bromoform	5.0 ug/l	ND
Bromomethane	5.0 ug/l	ND
2-Butanone	5.0 ug/l	ND
Carbon Disulfide	5.0 ug/l	ND
Carbon tetrachloride	5.0 ug/l	ND
Chlorobenzene	5.0 ug/l	ND
Chloroethane	5.0 ug/l	ND
2-Chlorethyvinyl ether	5.0 ug/l	ND
Chloroform	5.0 ug/l	ND
Chloromethane	5.0 ug/l	ND
Dibromochloromethane	5.0 ug/l	ND
1,1-Dichloroethane	5.0 ug/l	ND
1,2-Dichloroethane	5.0 ug/l	ND
1,1-Dichloroethene	5.0 ug/l	ND
trans-1,2-Dichloroethene	5.0 ug/l	ND
1,2-Dichloropropane	5.0 ug/l	ND

* Detection limits may vary with the type of sample and with the concentrations of other species present.

** ND: Not detected, below the detection limit.

This report applies only to the sample, or samples, investigated and is not necessarily indicative of the quality or condition of apparently identical or similar products. As a mutual protection to clients, the public and these Laboratories, this report is submitted and accepted for the exclusive use of the client to whom it is addressed and upon the condition that it is not to be used in whole or in part in any advertising or publicity matter without prior written authorization from these Laboratories.

Exxon
Laboratory Number 31362

Constituent	Detection* Limit ug/l	Concentration** ug/l(ppb)
cis-1,3-Dichloropropene	5.0 ug/l	ND
trans-1,3-Dichloropropene	5.0 ug/l	ND
Ethyl Benzene	5.0 ug/l	8.99
2-Hexanone	5.0 ug/l	ND
4-Methyl-2-pentanone	5.0 ug/l	ND
Methylene Chloride	5.0 ug/l	ND
Styrene	5.0 ug/l	ND
1,1,2,2-Tetrachloroethane	5.0 ug/l	ND
Tetrachloroethene	5.0 ug/l	ND
Toluene	5.0 ug/l	94.3
1,1,1-Trichloroethane	5.0 ug/l	ND
1,1,2-Trichloroethane	5.0 ug/l	ND
Trichloroethene	5.0 ug/l	ND
Vinyl Acetate	5.0 ug/l	ND
Vinyl Chloride	5.0 ug/l	ND
Xylenes	5.0 ug/l	56.5

* Detection limits may vary with the type of sample and with the concentrations of other species present.

** ND: Not detected, below the detection limit.

Respectfully submitted,

TRUESDAIL LABORATORIES, INC.

Gregory W. Everett
Project Manager

LD12-00056.C

Appendix 1

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APPLICANT'S COPY

TOTAL MERCAPTAN PROCEDURE

SANITATION DISTRICTS OF LOS ANGELES COUNTY

A. SCOPE AND APPLICATION

This laboratory procedure is applicable to the measurement of low molecular weight organo-sulfur compounds which cause, or have the potential for causing, obnoxious odors in wastewater conveyance and treatment systems. The method is not specific for mercaptans as it also detects other odorous species such as organic sulfides, which are capable of reacting to form the red-colored complex in the test procedure.

B. SUMMARY OF THE TEST PROCEDURE

The test is a colorimetric method adapted to wastewater from a standardized method for measuring mercaptans in air (ASTM D2913-70T, Mercaptan Content of the Atmosphere). The organo-sulfur compounds are absorbed by a solution of mercuric acetate, and a red color complex is formed using a solution of N, N-dimethyl-p-phenylene diamine hydrochloride and ferric chloride. The intensity of the color produced is proportional to the concentration of the organo-sulfur compounds (expressed as S). The absorbance is measured at 500 nm.

C. COMMENTS

The test responds to reduced organic sulfur in the organo-sulfur compounds on approximately an equimolar basis.

Sulfur dioxide and hydrogen sulfide do not interfere with the test procedure.

The test should be run at room temperature and in aqueous solution. These conditions are suggested in the literature to prevent interference from aromatic and heterocyclic sulfur compounds as well as polysulfides, sulfur proteins and other higher molecular weight sulfur compounds.

D. PRECISION AND ACCURACY

Duplicate analyses of wastewater gave an average percent difference of 4.7 percent. Recovery from industrial wastewater matrices averaged 90.3 percent.

For further information, please contact Henry Kendall or Rodger Baird of the San Jose Creek Water Quality Laboratory, Sanitation Districts of Los Angeles County, P. O. Box 4998, Whittier, CA 90607, (213) 699-0405

TOTAL MERCAPTAN PROCEDURE

A. PROCEDURE

1. Transfer 10.0 mL of absorbing solution [5% $Hg(C_2H_3O_2)_2$] to a 25 mL volumetric flask.
2. Add 10.0 mL of sample (or smaller aliquot when required).
3. Add 2.0 mL of freshly prepared color developing reagent, dilute to volume with distilled water and mix well by inversion.
4. After 20 minutes, filter through a glass fiber disc (Whatman GF/C or equivalent), using a suitable vacuum apparatus (Millipore filtration assembly or similar).
5. Measure absorbance without delay in 5 cm cells at 500 nm against a similarly prepared reagent blank.

NOTE: For spiking or standard curve preparation, the absorbing solution in Step 1 should be reduced by the volume of added standard since standard solutions are prepared in a mercuric acetate matrix.

B. TURBIDITY CORRECTION

Turbidity correction applies to all sewage and industrial wastewater. This determination duplicates procedure A except for color reagent substitution by hydrochloric acid (HCl).

1. Transfer 10.0 mL of absorbing solution to a 25 mL volumetric flask.
2. Add an identical sample aliquot as used in Procedure A.
3. Add 1.5 mL conc. HCl, dilute to volume with distilled water, stopper, and mix by inversion.
4. Vacuum filter through a glass fiber disc.
5. Measure absorbance in 5 cm cells at 500 nm against a distilled water reagent blank containing 10.0 mL $Hg(C_2H_3O_2)_2$ and 1.5 mL HCl only.

NOTE: Reagent blank B is not equivalent to reagent blank A.

C. CALIBRATION

A calibration curve is prepared by pipetting appropriate aliquots of diluted standard lead mercaptide (1.0 - 6.0 mL = 6.66 - 40.0 ug S) into a series of 25 mL volumetric flasks and diluting each to 10.0 mL with absorbing solution [5% $Hg(C_2H_3O_2)_2$]. Proceed with color development, filtering and absorbance measurements as specified in Procedure A. Turbidity corrections do not apply here.

D. CALCULATIONS

$$\text{Mercaptan Sulfur (mg S/L)} = \frac{(A-B)}{\text{mL sample}}$$

A = ug S procedure A (sample)
B = ug S procedure B (turbidity)

NOTE: Results are expressed as methyl mercaptan sulfur; there is evidence that this is valid up through hexyl mercaptan due to similarity in molar absorptivity.

E. EQUIPMENT

1. Volumetric flask, Pyrex class A, 25 mL.
2. Filtration Assembly, Millipore or equivalent.
3. Vacuum source, vacuum pump or water aspirator
4. Glass fiber filter discs, Whatman GF/C or equivalent.
5. Spectrophotometer.
6. Photometric cells, Pyrex, 5 cm path length.

F. REAGENTS

1. Amine Hydrochloric Acid Stock Solution. Dissolve 5.0 g of N,N-dimethyl-p-phenylenediamine hydrochloride (p-amino dimethylaniline hydrochloride) in one liter of conc. HCl. Transfer to amber reagent bottle, refrigerate and protect from light. This solution is stable for six months.

2. Reissner Solution. Dissolve 33.8 g of ferric chloride hexahydrate in distilled water, dilute to 250 mL and mix with 250 mL of nitric acid solution containing 36 mL of boiled conc. nitric acid (sp. gr. 1.42). Refrigerate.

3. Color Developing Reagent. Mix three volumes of solution 1 (Amine-HCl) and one volume of Reissner Solution. Prepare fresh for each set of determinations.

4. Absorbing Solution. Dissolve 50 g of mercuric acetate in 400 mL distilled water and add 25 mL of glacial acetic acid. Dilute to one liter. The mercuric acetate must be free of mercurous salts to prevent precipitation of Hg_2Cl_2 during color development. Test for absence by adding 3 mL of conc. HCl solution to 3 mL of absorbing solution.

5. Stock Lead Mercaptide Solution. Weigh out 156.6 mg of lead mercaptide [lead(II) methanethiolate,$Pb(SCH_3)_2$] and dilute to 100 mL with reagent 4 in a volumetric flask. This solution contains 333 ug/mL of mercaptan sulfur.

6. Standard Mercaptan Solution. Dilute 2.0 mL of stock solution 5 to 100 mL with reagent 4 in a volumetric flask. This solution contains 6.66 ug/mL of mercaptan sulfur.

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G. INTERFERENCES

Dimethyl disulfide and hydrogen sulfide may cause turbidity in the absorbing solution prior to addition of the color-developing reagent. This should be filtered out prior to color development. Colorimetric interference contributed by H_2S is less than 2%. Sulfur dioxide and nitrogen dioxide do not interfere. Equimolar colorimetric response may be expected for mercaptan and organic sulfides.

H. RANGE

The method has a detection limit of 0.1 mg/L with a 10 mL sample and is linear up to 60 ug S.

1×10^{-4} g/L

I. REFERENCES

This procedure was adapted for wastewaters from ASTM D2913-70T, a tentative method for mercaptan content of the atmosphere.

Comment Number: 46-Hiii-1

Docket Number: LD12 - 00056

Commenter: Exxon Chemical Company

Issue: Halogenated Organic, Pharmaceutical, Brominated Organic, Organo-Sulfur Compound, and Organo-Nitrogen Compound Wastes

Subissue: Organosulfur Wastes

Response:

The commenter submitted a package of data characterizing both a chemical oxidation treatment, namely chlorine dioxide, as well as an analytical method for organosulfur wastes.

The information provided to EPA by the commenter on chemical oxidation (chlorine dioxide oxidation) supports the establishment of chemical oxidation as one of the treatment methods specified as the BDAT treatment standard for organosulfur wastewaters.

EPA agrees that the analytical method described by the commenter (a total organic sulfur method) is useful for evaluating the general performance of an oxidation technology such as that described; however, EPA cannot develop concentration-based BDAT treatment standards based on this data because the method does not quantify the individual U and P organosulfur compounds, nor does it differentiate regulated from unregulated organosulfur compounds. A "total organic sulfur" number gives no indication of what percentage of the organic sulfur comes from U and P organosulfur constituents in a mixture and how much comes from nontoxic and unregulated organosulfur compounds in the waste stream.

ISSUE CODE 47: Halogenated Pesticide and Chlorobenzene, Halogenated Phenolic, and Phenolic Wastes

A.-.Phenolics

  i. Direct Reuse as BDAT Option for Liquid U052 (Cresol) and U188 (Phenol)

B.-.K085

  i. Treatment Standards for PCBs

Comment Number: 47-Ai-1

Docket Number: LD12-C0114

Commenter: MERICHEM COMPANY

Issue: Halogenated Pesticide and Chlorobenzene, Halogenated Phenolic, and Phenolic Wastes

Subissue: Phenolics

Comment:

II. DIRECT REUSE OF LIQUID U052 AND U188 WASTES

Merichem's Greens Bayou plant was specifically designed to produce pure cresol and phenol from aqueous caustic streams from refineries and coal processes.

Merichem's advanced process technology allows the recovery of spills of pure cresol (U052) or phenol (U188) in the liquid state, by injection of said liquids at different parts of our process depending on the purity of the liquids.

Merichem's proposed direct reuse of liquid U052 or U188 wastes accomplishes several environmental goals:

1. Foments waste minimization;
2. Increases incineration capacity;
3. Minimizes environmental risk.

Merichem urges EPA to promulgate direct reuse as the treatment standard for liquid U052 and U188 wastes.

Comment Number: 47-Ai-1

Docket Number: LD12 - 00114

Commenter: Merichem Company

Issue: Halogenated Pesticide and Chlorobenzene, Halogenated Phenolic, and Phenolic Wastes

Subissue: Phenolics

Response:

The commenter urges EPA to promulgate direct reuse as the BDAT treatment standard for U052 (cresol) and U188 (phenol) wastewaters.

The Agency is promulgating concentration-based BDAT treatment standards for U052 and U188 nonwastewaters and wastewaters. As a result, affected facilities may use any treatment technology as long as the numerical BDAT treatment standards are met by the resulting residuals. Therefore, if the commenter's recovery technology generates a residual, that residual must meet the promulgated concentration-based treatment standards.

Comment Number: 47-Bi-1

Docket Number: LD12-00129

Commenter: Olin

Issue: Halogenated Pesticide and Chlorobenzene, Halogenated Phenolic, and Phenolic Wastes

Subissue: K085

Comment:

Olin agrees with USEPA in setting a concentration based treatment standard for PCB's for K085 wastes (Distillation of fractionation columns bottoms from the production of chlorobenzenes). However, the Agency has set an unjustified treatment level for PCB's. The Agency does not give a rationale for the level selected and even states that PCB's are only regulated in concentrations greater than 50 ppm. For over 10 years, USEPA has regulated the use of PCB's greater than 50 ppm. Clearly, disposal entails less potential for exposure than use. Therefore, there is no justification for the proposed treatment standard. We submit that USEPA should rethink its position and set the concentration standard at 50 ppm which is the regulated level under both TSCA and RCRA (see RCRA Section 3004(d)(2)(D)) for PCB's.

Comment Number: 47-Bi-1

Docket Number: LD12-00129

Commenter: Olin

Issue: K085

Subissue: Treatment standards for PCBs

Response:

The Agency disagrees with the commenter. Under the Hazardous and Solid Waste Amendments of 1984 (HSWA), EPA was given the authority to regulate wastes before their placement in land disposal units. These wastes are regulated with treatment standards that are based on the levels of treatment that can be achieved by a treatment technology. The treatment standards are established to be protective of human health and the environment.

Certain listed wastes, such as K085, contain PCBs. The PCB component of such a waste is regulated primarily under TSCA, while the entire listed waste is regulated under RCRA. As discussed in the November 22, 1989 proposed rule (54 FR 48398), a listed waste containing PCBs must meet the applicable requirements under both statutes. Such a waste must be treated by an incinerator permitted under both TSCA and RCRA and any residuals from incineration must meet the treatment standards for the specific waste constituents prior to land disposal. EPA believes that this approach is consistent with statutory mandates and is promulgating the K085 treatment standards as proposed.

Comment Number: 47-Bi-2

Docket Number: LD12-00124

Commenter: Rollins Environmental Services (DE) Inc.

Issue: Halogenated Pesticide and Chlorobenzene, Halogenated Phenolic, and Phenolic Wastes

Subissue: K085

Comment:

The Aroclor treatment standards for K085 are too low to be properly checked during routine analysis of incineration residues. PCB's are routinely analyzed by SW-846 method 8080 using gas chromatograph (GC) with Electro Capture Detector (ECD). ECD is very sensitive to highly chlorinated compounds like Hexachlorobenzene or Pentachlorobenzene. If a treated K085 waste contains up to 4.4 mg/kg of Hexachlorobenzene or Pentachlorobenzene -- i.e., the proposed treatment standard for these constituents -- the ECD responses of these two compounds will be so high that PCB's cannot routinely be detected by standard methods at the 0.13 mg/kg level, which is the proposed BDAT treatment standard for PCB's. K085 also is likely to contain some non-regulated chlorinated compounds which can be left in the treatment residues and would interfere with PCB analysis at low detection limits. Therefore, for K085 containing less than 50 ppm PCB's, we suggest that EPA revise the treatment standard to 4.4 mg/kg Aroclors, the same as the standard for other K085 constituents.

With respect to K085 containing 50 ppm or more of PCB's, such wastes must be incinerated in a TSCA permitted incinerator. TSCA permitted facilities incinerate PCB material containing high levels of PCB's. Under TSCA, the residues may be placed in a RCRA landfill if the residues contain < 50ppm of PCB's. It would likely be economically infeasible for TSCA incinerators to incinerate K085 wastes separately form all other PCB wastes. Accordingly, unless the BDAT treatment standards of K085 TSCA wastes are raised closer to the 50 ppm level applicable to other TSCA wastes, it is unlikely that TSCA facilities will find it economically feasible to accept K085 wastes.

Comment Number: 47-Bi-2
Docket Number: LD12-00124
Commenter: Rollins Environmental Services (DE) Inc.
Issue: K085
Subissue: Treatment standards for PCBs
Response:

As stated in the November 22, 1989 proposed rule (54 FR 48398), the Agency believes that incineration virtually destroys all organic constituents (including hexachlorobenzene, pentachlorobenzene, and other organic constituents not regulated under BDAT); accordingly, interferences due to the presence of organics in the ash and scrubber water matrices are not expected to be a problem in analyzing for PCBs. Additionally, the treatment standard calculation accounts for analytical capabilities and variability in sampling and analysis by multiplying constituent concentrations in the treatment residuals (i.e., ash and scrubber water) by an accuracy correction factor and a variability factor. (The details of the K085 treatment standard calculations are discussed in the BDAT Background Document for Halogenated Pesticide and Chlorobenzene Wastes.) Consequently, the concentration-based treatment standards represent the concentrations that an analytical instrumentation system can reliably report, rather than the actual constituent concentrations in the treatment residuals. Therefore, EPA is promulgating the K085 treatment standards as proposed. The Agency reminds the commenter that treatability variances are available on a case-by-case basis for generators who cannot meet the treatment standards.